April 17, 1972

O&M CRITERIA SHEET

TM 4-144-39, Volume IV

Recommendations received from the equipment manufacturer have resulted in changes in several components used in the Electrical Elevator System, Vertical Assembly Building. These changes involve items noted below.

It is recommended that holders of subject manual be aware of the following data changes in subject manual.

Figure 8-37, Sheet 1 of 3

FORMER ENTRY

Contractors'

Symbol No.	Service Part No.	Item Name
71	375P6	Fuses
72	375P3	
73	375P4	

NEW ENTRY RECOMMENDED

71	375P8	Fuses
72	375P3	
73	375P6	

NOTE: This change required as result of Otis Field Change.

ECN 76363

W.O. 7038-1703-74

DATE February 15, 1974

O&M CRITERIA SHEET

TM4-144-39
Volume I

NOTE

Since the schematics in this manual apply only to VAB High Bay Elevators 1, 3, and 6, this criteria sheet affects only those elevators.

The following criteria are recommended:

1. Page 1-24, paragraph 1-106h. Delete the existing entry and add: "h. The door open override switch (DOOS), when placed in the FIRE position, causes the door opening sequence to be initiated by the front and rear door opening push buttons. Upon release of the door opening push buttons, the door will close."

2. Page 2-12, paragraph 2-57. Delete the following in the last sentence: "or is shut down by EMERG STOP switch operation."

3. Page 2-12, paragraph 2-58. Add: "Both emergency stop switches are rendered ineffective during emergency recall."

4. Page 3-33, paragraph 3-179. Change EMERGENCY SERVICE keyswitch callout from "2FIS" to "1FIS."

5. Page 3-34, paragraph 3-179a. Add "ESBR," before "FIS" in the list of emergency-service relays.

6. Page 3-34, paragraph 3-179c. Add "ESBR," before "FIS."

7. Page 3-34, paragraph 3-179f. After the second sentence, add: "Car emergency stop switches are bypassed by ESBR contacts 3-4(5) and 7-8(10)."

8. Page 3-35/3-36, paragraph 3-180, second sentence. Add "ESBR(2)," before "1FIS(2)."

9. Page 3-35/3-36, paragraph 3-180b. Delete the existing entry and add: "b. Doors can be closed by constant pressure on the door close button DCB. Doors open automatically at the selected floor except when the door open override switch (DOOS) is placed in the FIRE position. With switch DOOS in the FIRE position, front and rear door opening relays 1DO, 2DO, R1DO and R2DO will energize only with constant pressure on the door open push buttons FDO and RDO. Upon release of either push buttons FDO or RDO the respective elevator door will close. Upon arrival at the desired car call landing, door open push buttons RDO and FDO must be activated to open the doors."

10. Figure 8-54 (Sheet 1 of 8). Change schematic in indicated areas to show addition of emergency relay ESBR (see Figures 1, 2, 3, 4, and 5).

11. Figure 8-54 (Sheet 3 of 8). Change schematic to reflect addition of emergency relay ESBR (see Figures 6 and 7).

12. Figure 8-55 (Sheet 1 of 2). Remove telephone jack in Car Panel No. 1 and add toggle switch (See Figure 8).

13. Figure 8-55 (Sheet 1 of 2). Add two switch contacts in Car Panel No. 2 (See Figure 9).

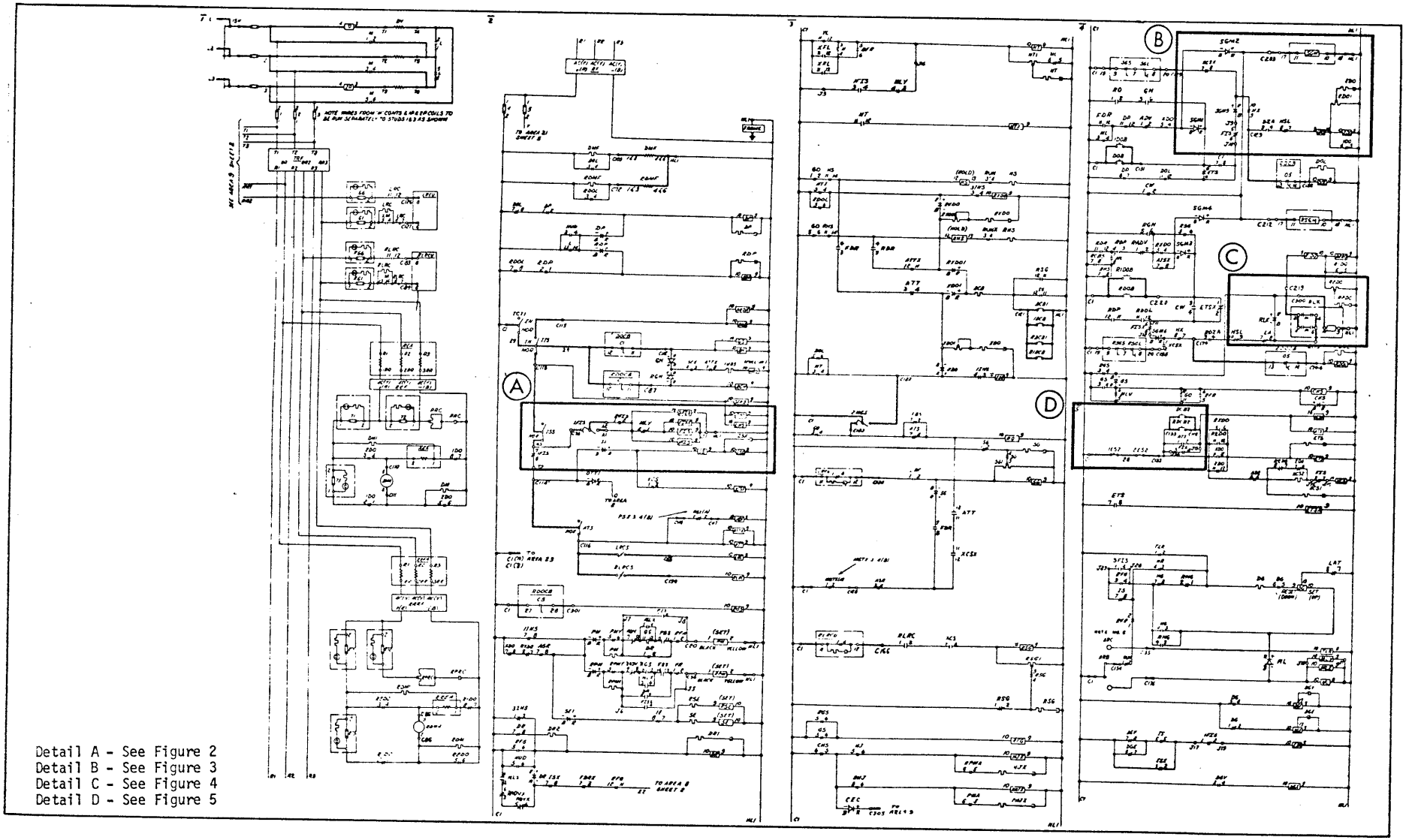


Figure 1. Location Diagram, Figure 8-54 (Sheet 1 of 8)

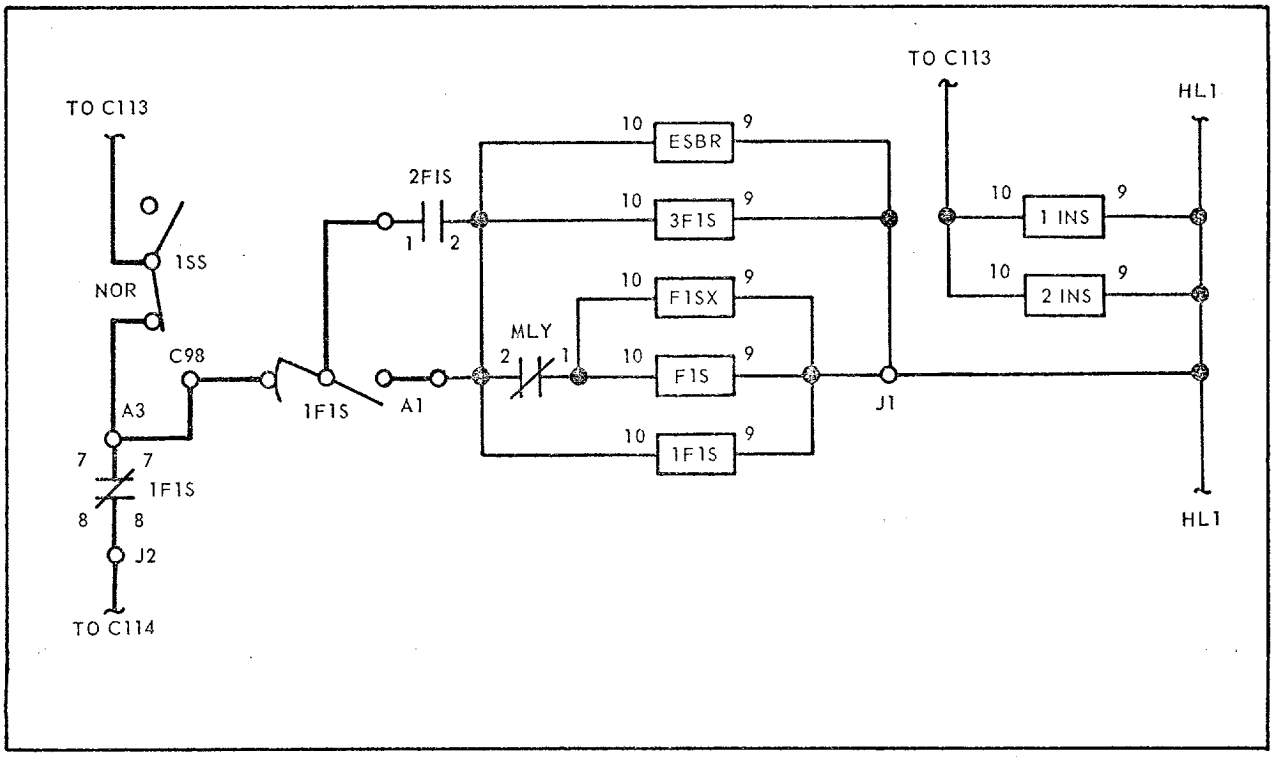


Figure 2. Detail A (Reference Figure 1)

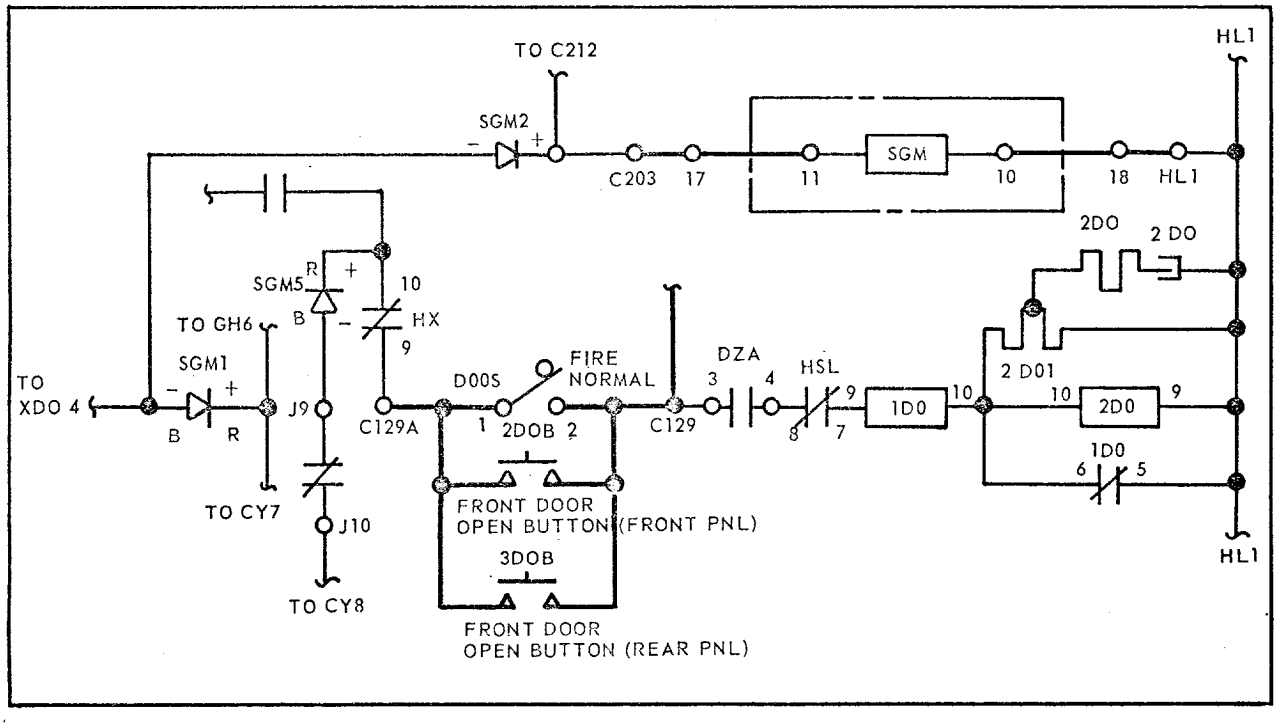


Figure 3. Detail B (Reference Figure 1)

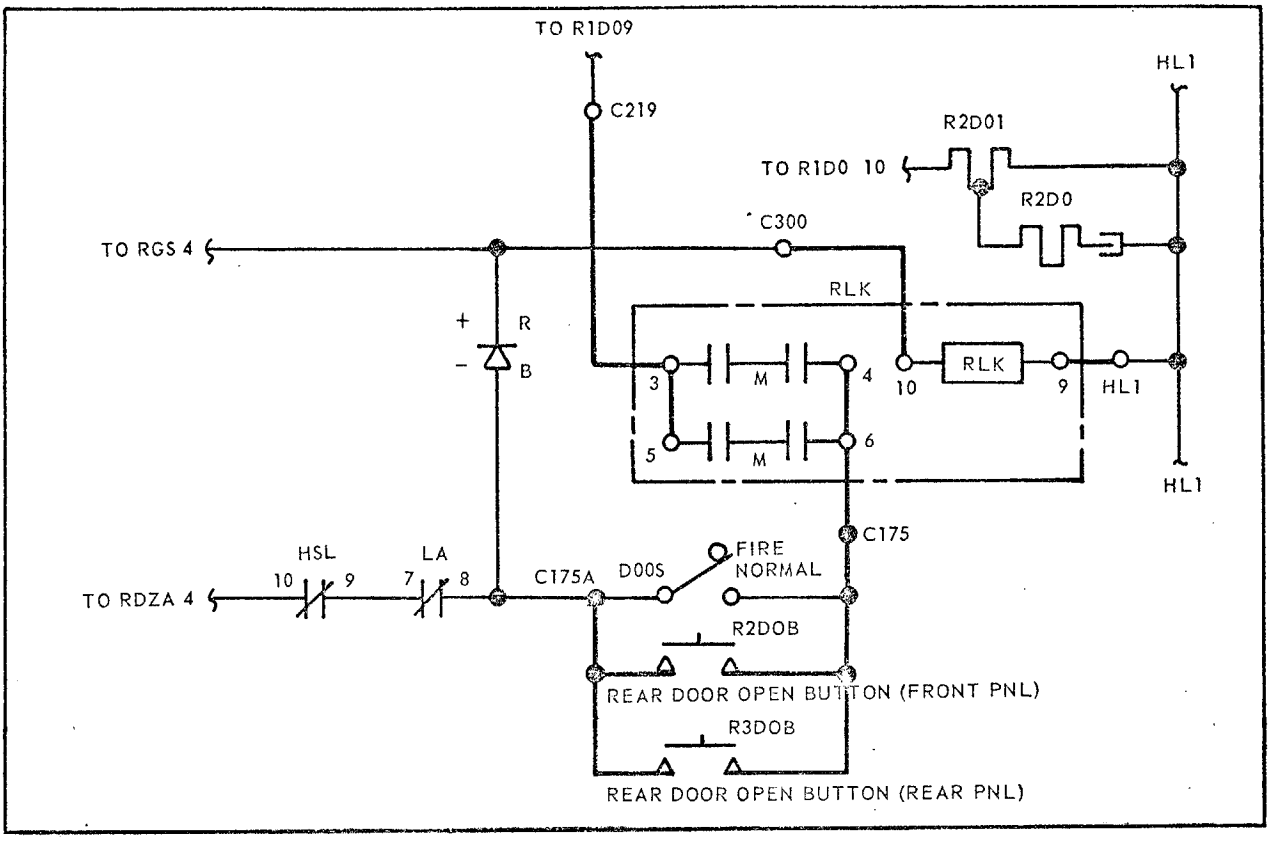


Figure 4. Detail C (Reference Figure 1)

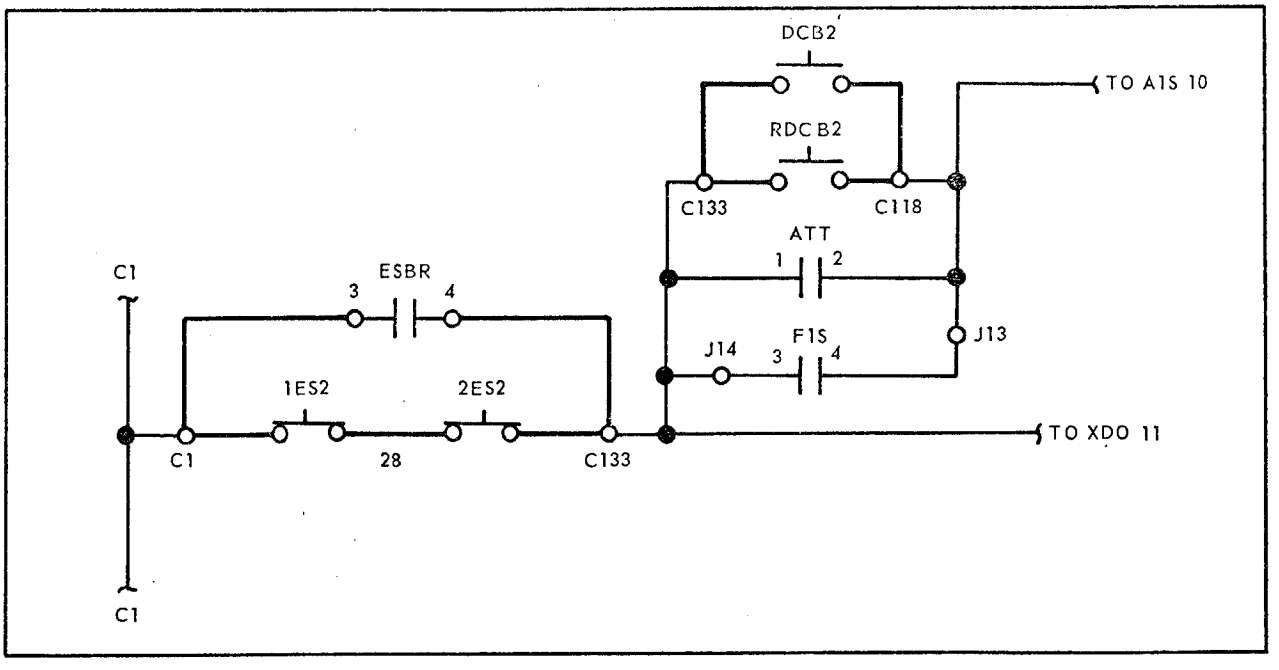


Figure 5. Detail D (Reference Figure 1)

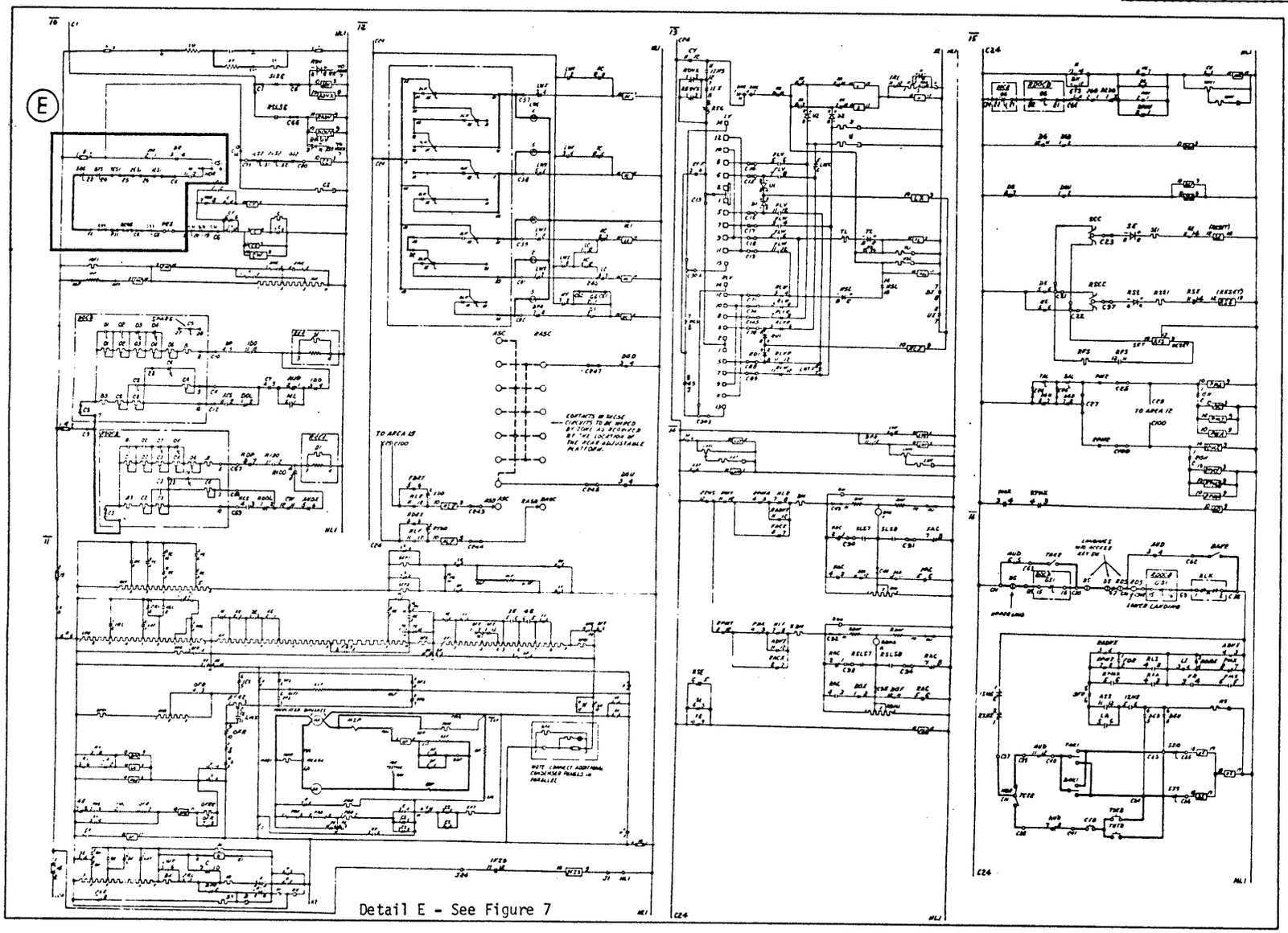


Figure 6. Location Diagram, Figure 8-54 (Sheet 3 of 8)

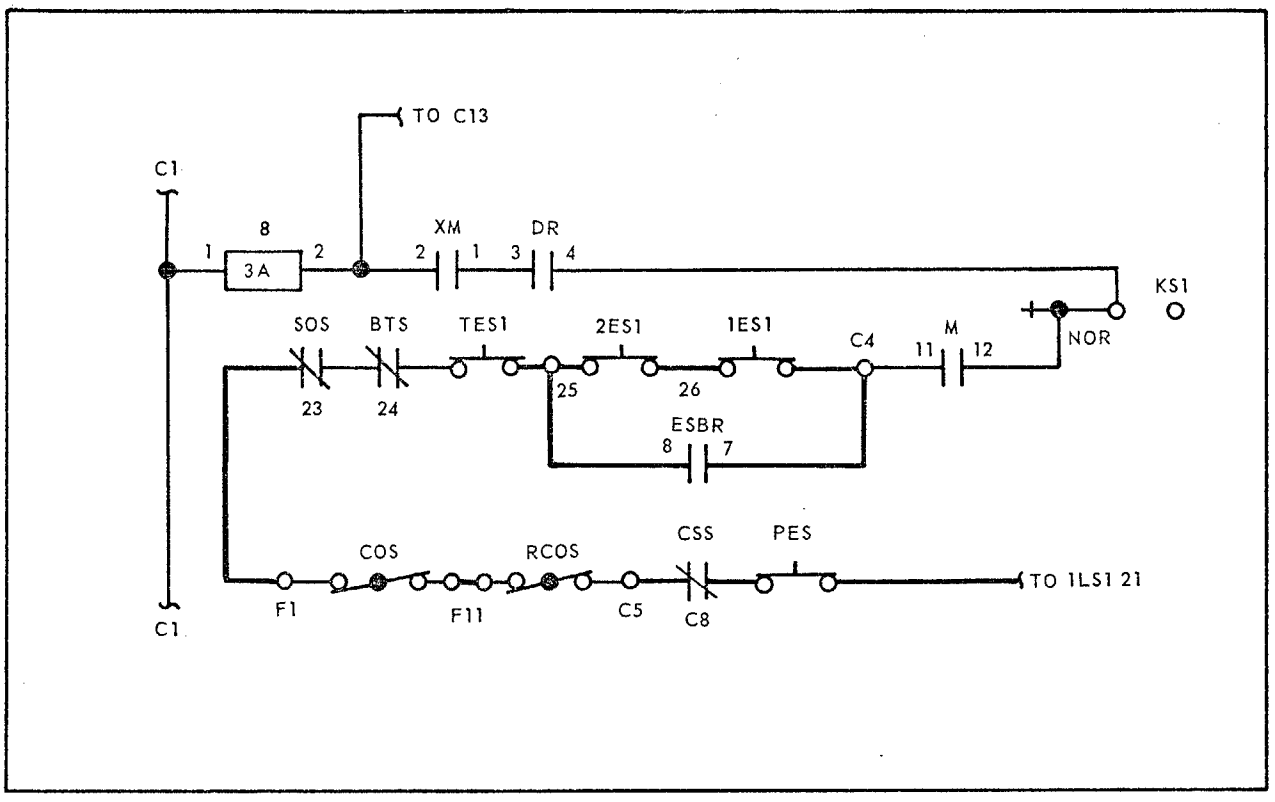


Figure 7. Detail E (Reference Figure 6)

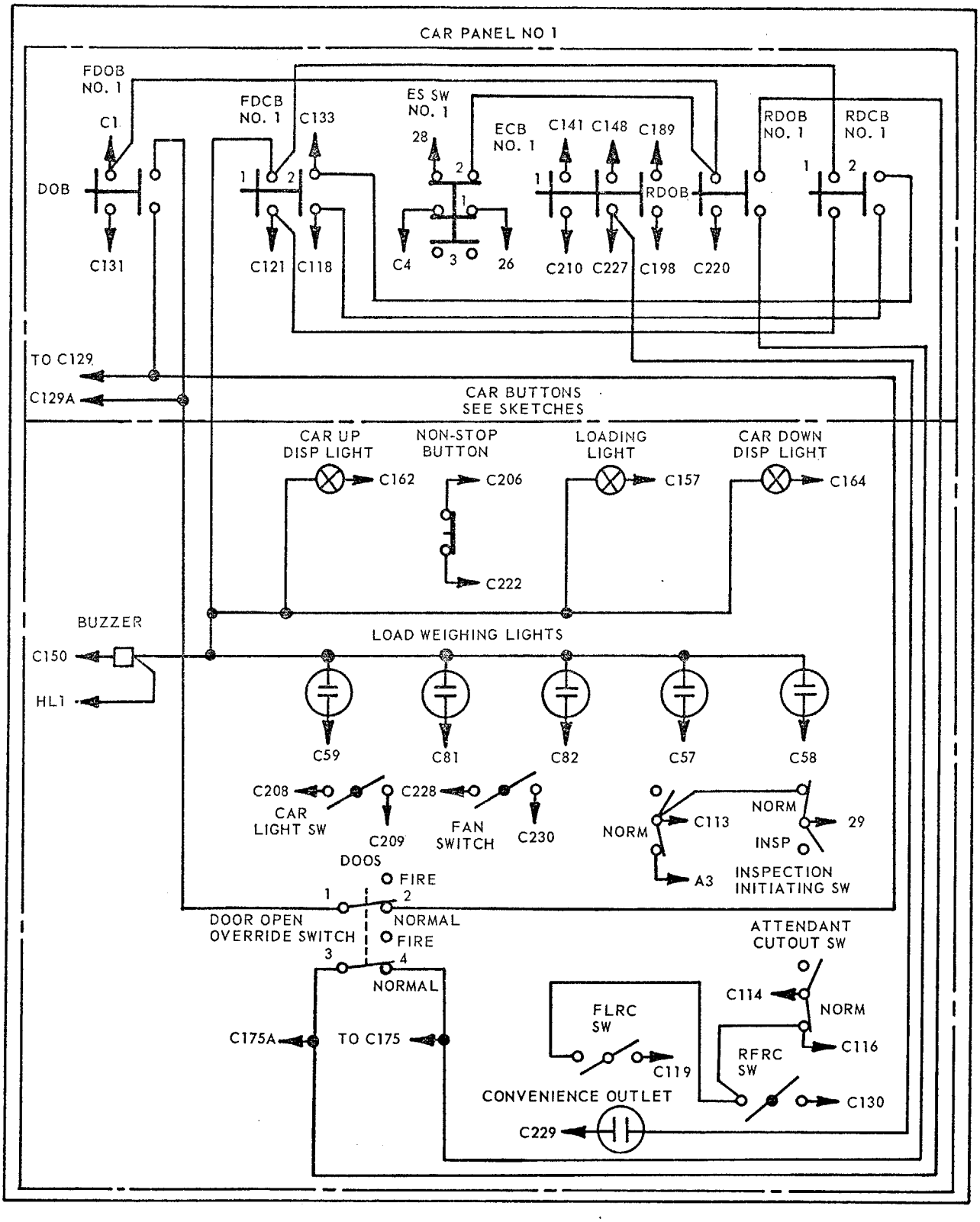


Figure 8. Revised Car Panel No. 1

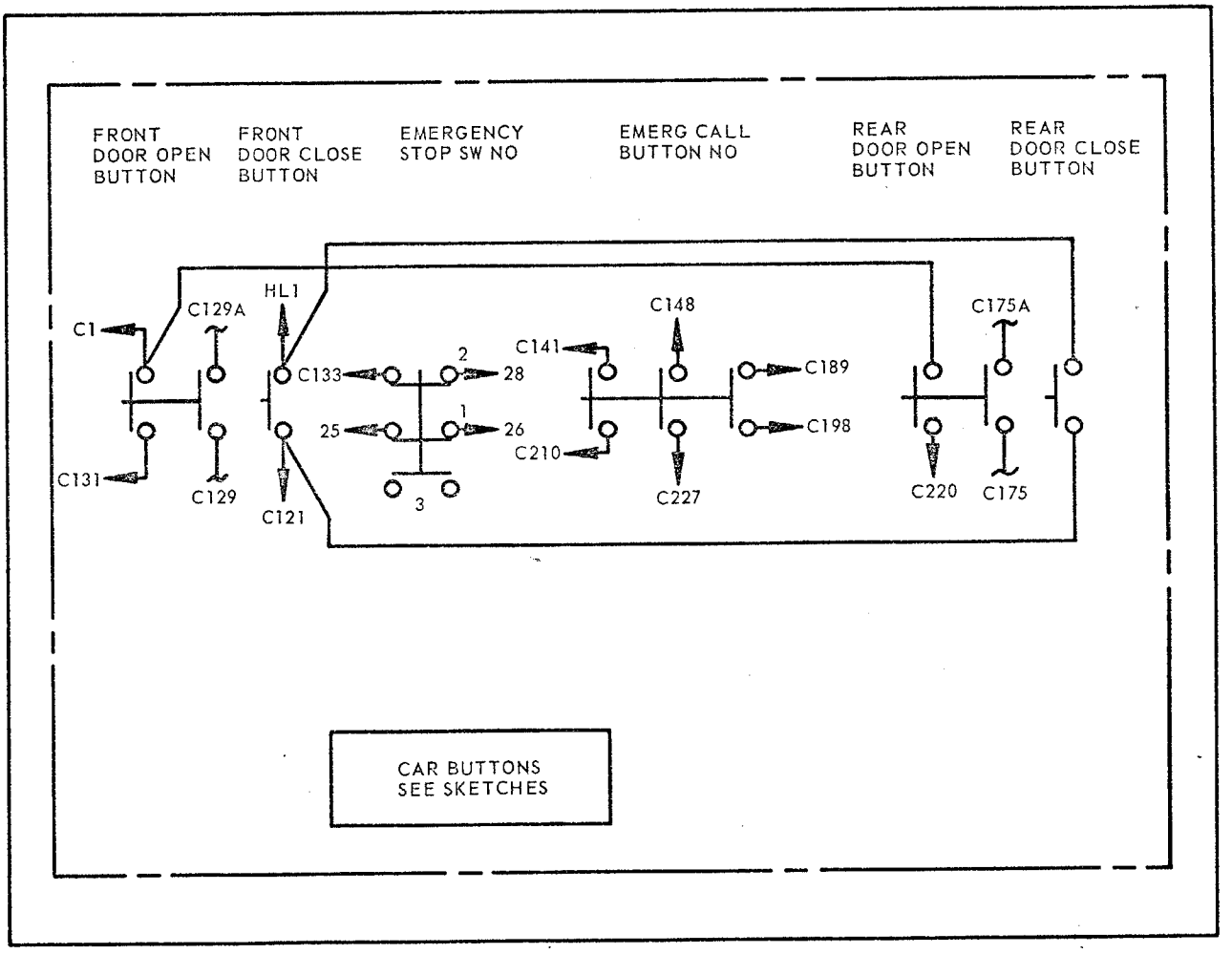


Figure 9. Revised Car Panel No. 2

19/

March 24, 1972

O&M CRITERIA SHEET

TM 4-144-39, Volume I

Recommendations received from the equipment manufacturer have resulted in changes in several components used in the Electrical Elevator System, Vertical Assembly Building. These changes involve items noted below.

It is recommended that holders of subject manual be aware of the following data changes in subject manual.

Figure 8-43, Sheet 4 or 5

FORMER ENTRY

Contractors'

Symbol No.	Service Part No.	Item Name
71,R71*	375P6	Fuses
72,R72	375P3	
73,R73*	375P4	

NEW ENTRY RECOMMENDED

71,R71*	375P8	Fuses
72,R72	375P3	
73,R73*	375P6	

NOTE: This change required as result of Otis Field Change.

Form WEA (5-69)

ELECTRIC ELEVATOR FIELD TEST AND DATA REPORT TM-144

(Send One Copy To General Construction Manager's Office)

1. Name LB. Hi Bay Elev. #14 Contract No. 301038 Date 6/14/71
2. Location KSC LC #39 (City) ---, Fla. (State)
3. Duty 5000 (lbs.) @ 700 (fpm) Pass. ☐ Frt. ☐ Ser. ☒ SW ☐ DW ☐
4. Confirmed Power DC ☐ AC ☒ 480 (volts) 3 (phase) 60 (freq.) 4 (wires)
5. Mach. 26 9HT (size) Sheave 36" (diam.) round (groove) Located OH ☒ Below ☐ Side ☐ Shipped (date)
6. Operation: C.S. ☐ D.B. ☐ P.B. ☐ Coll. P.B. ☐ S.C. ☐ U.A.L. ☒ Other (name) U.M.V. ☒ Resist. ☐
7. Ropes 8 (no.) 6/8" (size) Roping 1:1 ☒ 2:1 ☐ or (denote) Rope Mfr. Beth-
8. Compensation 6 - 5/8" (size and no.) ropes Tied Down N/A Type Car Safety Special D Cwt. N/A
9. Rise 419' 9" No. Stops 31 No. Openings 32 Specified Counterbalance 42.5 %
10. Door Opening 60" (width) 1 Sp.S.O. 2 Sp. S.O. ✓ (check type of doors) C.O. Hangers (type) AU (car) 7060 (hoistway)
11. Door Operator 6970A (type) Door Detector Safety Shoe + Light Ray (type) Otis Service N/A (type) (start date)

---

12. Counterbalance Test: Crank ☐ D.C. Ammeter ☒ Tachometer ☒ Other ☐ (explain)
13. Bal. Load 3400 (lbs.) Subwts. 31 (no.) 13 @ 297 (approx. ¼ lb./cu.") Lbs.
14. To Correct Counterweighing 0 (number) Sub Weights were (Added) (Removed) (cross out one) No. Bal. Weights Added {Car 0 / Cwt. 0}
15. Car Safety Test: Hand ☒ Runaway ☐ Load in Car? 8000 (lbs.) Car Set Level? Yes (within ⅛" per foot of d. b. s.) Slide 2' 9" (rail marking)
    CWT. Safety Test: Hand ☐ Runaway ☐ Load in Car? N/A (lbs.) CWT. Slide N/A"
    Pot. Sw. Slowdown Hoistway Sw. Set Do. N/A" From Top Fl.—Up From Bott. Fl. N/A" If on Sel. Ck. ☐
    Speed Pot. Sw. Slowdown Contact Closes: Up N/A (f. p. m.) Do. N/A (f. p. m.) On Gov. ☐ Plug. Sw. Sel. ☐ (check one)
16. Governor Tripping Speed 840 (f. p. m.) How Checked? overspeed Contact 796 (pot) (f. p. m.) Contact 740 (field) (f. p. m.)
17. O.H. Car 111" Pit Cwt. 8¼" Up Limit Opens 12"
18. O.H. Cwt. 127" Pit Car 103¾" Do. Limit Opens 10"
19. Pit Depth 144" Final Limits Through Bolted ☒ O.H. Car to Nearest Striking Point 109"
20. Buffers: Car Type oil (2) Stroke 33½" Cwt. Type oil Stroke 33½"
21. Car Statically Balanced % Load 30% { Top Hoistway ☒ / Center Hoistway ☒ / Bottom Hoistway ☒ } Roller Guides Adjusted ☒
22. Power Oper. Doors Yes A.S.A. Code Door Close Time 5 Secs. Door Speed 1' of Fast Speed 1 Secs.
    Door Close Time (Otis Card) 5.5 Secs. Lbs. Thrust Close 25 Door Open Time 3.5 Secs.
    Time Before Nudging 22 Secs. Door Close Time in Nudging 6.5 Secs.
23. Worm Gear Bearing Contacts: Cross Corner ☐ N/A Central ☐
24. Brake Set 125% Load A.C. Yes Per Brake Load Chart D.C. —— Lbs. in Car 10,000
25. Worm Thrust Clearance N/A" Backlash N/A Secondary Gear Contact N/A Clearance N/A"
26. Any Objectional Noise? None Any Objectional Heating? None (explain)

JM4-144

27. Elev. Motor Serial No. 203402 (size) 36MUT (amps.) 355 (ful. volts) 315 (fld. volts) N/A (rpm) 711/23 (hp) 150

28. Motor Generator: (size) 5 BMG (rpm) 1200 (gen. kw.) 70 (gen. volts) 315 (gen. amps.) 222

Gen. Driving Motor (size) 3 ONC (hp) 110 (volts) 480 (amps. per line) 130 (temperature rise) 50°C

Exciter (type) 23 GX (rpm) 1200 (kw.) 7.5

29. Commutation (elev. motor) Good (gen.) Good (d. c. gen. motor) N/A (exciter) Good

30. Controller (type) 23WA4 Serial No. 219559 W/D No. 23-1145698 7H

Damping-Condensers Total Used MFDS. 9600 Res. Value 0 Condensers in Brake Timing MFDS 2200

31. Overload Relays Checked, Controller and Starter: 1P 11 2P (time in seconds) 12 3P 26; 3P (amps.) 150

32. Actual Line Voltage (At P. H. Switch) (start) 465 (idle) 470 (full speed) 470

33. Main Fuses or Circuit Breaker Setting (amps.) 200 Rectifier or Exciter Voltage (idle) 130 → 125 (full load) 130 → 125

34. Car Speed, Elevator Motor Current, and Voltage Values:

NOTE: The values for Items 34 thru 38 should be obtained with CORRECT counterbalance.

Speed for all Elevators—All Ammeter Readings for U. M. V. and D. C.—Full Load Reading Only for A. C.—Indicate Negative Readings with Minus Sign.)

Actual Weight In Car		Car Speed F. P. M.	Amperes Start	Amperes Run	Amperes Stop	Volts Run	Micro Slow-Speed F.P.M.
0 #	No Load Up	700	140	-150	-410	293	
0 #	No Load Do.	670	440	200	-90	295	
3400 #	Balance Load Up	680	340	25	-280	305	19
3400 #	Balance Load Do.	680	340	25	-280	305	19
4000 #	Full Load Up	665	620	280	-70	310	
8000 #	Full Load Do. (Field Switch Out)	690	120	-240	-550	288	
8000 #	Full Load Do. (Field Switch In)	605	120	-220	-550	286	

41. Volts

Car Button
CBo to CB + 135
CBo to CTB - 26
CBo to HL1 165
CBo to AC1 107

Hall Button
Bo to B + 640
Bo to B - 415
Bo to HL1 160
Bo to AC1 110

35. Car Speed Bal. Load Full Field 600 Arm. Volts Bal. Load Full Field 305

Elev. Motor Field Voltage (idling) 25 (full speed) 85 (leveling) 125 Norm. Circ. Current (amps.) 20 No. Turns Series Fld. 7

36. Loop Cir. Drop-hold Brake Current Rise Approach N/A Relevel N/A

Compounding Spread No Load ~~HSL~~ or TL (cross out one) Speed (f.p.m.) 16 Up 34 Do 18

Feed Back Ratio HSL Speed 18 to 1 Comp. Spread No Load 10U to 70U (accel.) N/A (stop) (lev.)

37. Loop Cir. ~~Amps. Current Stall Condition~~ Bal Load FPM: LFR (Full) 16 1RL 18 2RL 26 3RL N/A

38. Flight Time (Start to Stop) Bal. Load 1 Floor (in secs.) (up) 5.2 (down) 5.2 Fl. Height 12'8" } For Car Speeds 200 F. P. M. and Over. Brake to Brake

Flight Time (Start to Stop) No Load 1 Floor (up) 5.5 (down) 5.5 Fl. Height 12'8" }

39. Has Geared Machine Been Lined By Head Method? ☐ N/A

40. Gov. Seal Nos. C2894 CY719

Remarks

Sup't Mr. R.D. Moore

Erector Mr. N/A

Inspected by: City [ ] State [ ] Gov't [ ]

Adjuster Mr. W.F. Wade

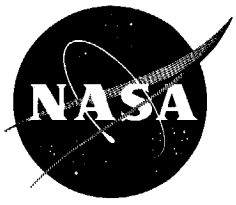
Inspector's Name

Approved by (Field Engineer) 6/4/71

6/4/71

(Please Do Not Submit Incomplete Reports to Headquarters)

TM4-144-39



JOHN F. KENNEDY
SPACE CENTER

TECHNICAL MANUAL

APOLLO/SATURN

LAUNCH COMPLEX 39

OPERATIONS AND MAINTENANCE

VEHICLE ASSEMBLY BUILDING
ELEVATOR SYSTEMS
HIGH-BAY ELEVATORS NUMBERS 1-16

VOLUME I OF III

KSC FORM 16-12 (4/66)

TECHNICAL MANUAL

APOLLO/SATURN

LAUNCH COMPLEX 39

OPERATIONS AND MAINTENANCE

VEHICLE ASSEMBLY BUILDING
ELEVATOR SYSTEMS
HIGH-BAY ELEVATORS NUMBERS 1-16

VOLUME I OF III

CHANGE NOTICE

LATEST CHANGED PAGES SUPERSEDE THE SAME PAGES OF PREVIOUS DATE

Insert changed pages into basic publication. Destroy superseded pages.

1 NOVEMBER 1965

CHANGED 27 OCTOBER 1971

LIST OF EFFECTIVE PAGES

Insert latest changes; destroy superseded pages.

NOTE: The portion of the text affected by the change is indicated by a vertical line in the outer margin of the page.

TOTAL NUMBER OF PAGES IN THIS DOCUMENT IS 230, CONSISTING OF:

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iii thru iv	1 Mar 68	Figure 8-1B	1 Mar 68
v thru vii	Original	Figure 8-2 thru 8-5	1 Mar 68
viii thru ix	1 Mar 68	Figure 8-6 thru 8-43	Original
x thru xi	Original	Figure 8-43A	1 Mar 68
xii	1 Mar 69	Figure 8-44 thru 8-53	Original
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5-1 thru 5-10	Original		
6-1 thru 6-2	Original		
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SECTION VIII - ILLUSTRATIONS

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APPENDIX B. Factory and Field Test Results

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INTRODUCTION

This handbook covers the service and maintenance of the electric elevators in the vertical assembly building of launch complex 39 on Merritt Island, Florida. It is divided into the following volumes:

I High-Bay Elevators 1-16

II High-Bay Elevator 17

III Low-Bay Elevators 18-21

IV LCC Building Elevators 22-25

V Control and Communication Panel

This volume describes the purpose, arrangement, operation, service and maintenance of the high-bay elevators 1-16. It is divided into the following sections:

Service

I System Description
II Operating Instructions
III Circuit Description

Maintenance

IV Preventive Maintenance
V Trouble Shooting
VI Overhaul
VII Special Tools and Test Equipment
VIII Illustrations

The present installation consists of the following 12 elevators:

ELEVATOR NUMBER	1, 3-4 5-6	9-10	11-12
Number of Stops*	20 now 26 future	26 now 20 future	32 now 14 future
Number of Front Openings	18 now 19 future	20 now 17 future	25 now 12 future
Number of Rear Openings	3 now 7 future	7 now 3 future	8 now 2 future

ELEVATOR NUMBER	13-14	15
Number of Stops*	33 now 13 future	25 21 future
Number of Front Openings	26now 11 future	19 now 18 future
Number of Rear Openings	8 now 2 future	7 now 3 future

*Front and rear openings at lowest stop are at same level.

Full group automatic operation is provided where both elevators in the group are installed. Where only a single elevator in the group is installed (elevators 1 and 15), simplex selective collective control is employed initially, but all group supervisory equipment required for the ultimate installation is provided. Position and operating panels are marked and equipment arranged for future ultimate stops.

Accordingly, this manual describes the ultimate installation consisting of 16 elevators (eight groups), each capable of making 37 front stops and 10 rear stops.

Emergency service (par. 2-55) is supplied only for elevators 1, 3, and 6.

SECTION I

SYSTEM DESCRIPTION

1-1. PURPOSE AND ARRANGEMENT

1-2. This installation (Figures 8-1 through 8-13) consists of 12 high-bay elevators in the vertical assembly building of launch complex 39 on Merritt Island, Florida. The elevators are operated in groups of two, each pair serving the tower shown in the table below.

Tower	Elevators
"A"	1
"B"	3-4, 5-6
"C"	None
"D"	9-10
"E"	11-12, 13-14
"F"	15

1-3. The paired elevators operate as a team, one car answering calls registered in either the up or down direction, the other answering calls "behind" the first elevator or calls registered in the other direction. Calls are answered in the order in which the landings are reached, irrespective of the order in which the buttons were pressed. Any elevator can be taken out of automatic service and operated by an attendant.

1-4. Elevators are dispatched automatically by the supervisory control system, each such system controlling the two cars in the group. The dispatching pattern -- up peak, down peak, up-down (off peak), and intermittent -- is selected by the supervisory control system in response to prevailing traffic conditions.

1-5. Each elevator consists of a counterweighted car operated by a gearless, double-wrap traction machine driven by an electric motor. The elevator is designed to carry a live load of approximately 8000 pounds at a nominal speed of 700 feet per minute.

1-6. The car has both front and rear doors. The front doors serve 37 fixed levels between the ground level and 419-foot level. Front stops are numbered from 1 through 37 on the signaling equipment. The rear doors serve 10 movable platforms that can be relocated vertically. Rear stops are designated by the letters A through H, J and K.

1-7. Table 1-1 lists the salient characteristics of the installation. Table 1-2 lists the principal components supplied. Table 1-3 lists the reference drawings available for use by elevator servicemen.

1-8. ELEVATOR CAR, PLATFORM AND CARFRAME

1-9. The elevator car is of sheet-steel construction, supported by a structural steel platform, platform and car being supported in turn by a structural steel carframe.

1-10. CAR INTERIOR

1-11. The car (Figure 8-14) has front and rear openings protected by power-operated sliding doors, an emergency ceiling exit, a car position indicator, two car operating panels, two ventilating fans, and recessed fluorescent lighting.

1-12. Car wall panels are of furniture sheet steel, coated with a baked enamel finish on one side and a bituminous sound-deadening compound on the reverse. (Side walls of elevators 11 and 14 are equipped with 5-1/2 foot vision panels.) The facia over the front and rear doors, the entrance columns, the coved base and all accessory hardware (handrail, pad hooks, and operating and indicating panels) are of satin finish stainless steel. The handrail is located on the side walls, approximately 3 feet above the platform. The double-ball hooks are provided on the side, rear, and return walls for hanging protective pads. The coved base is perforated for ventilation.

1-13. The pair of two-speed, power-operated doors, at both front and rear, slide on parallel tracks, the "fast" door moving twice the distance of the "slow" door. Doors are constructed of sheet steel with a baked enamel finish. (Rear car doors of elevators 11 and 14 are equipped with 5-1/2-foot vision panels.) The hollow interior is fitted with sound deadening material. Car doors open only when at a corresponding hoistway entrance. Where openings exist at both front and rear at a given hoist level, car doors will open only at the side for which the button was touched. Power-door operation and associated safety devices are described in paragraph 1-48.

TABLE 1-1. PRINCIPAL CHARACTERISTICS

LIVE LOAD	8000 pounds
NOMINAL SPEED	700 feet per minute
RISE	419'-9"
ROPING	1:1
NUMBER OF STOPS	37 front, 10 rear
NUMBER OF OPENINGS	37 front, 10 rear
CAR	
Inside Dimensions	92-3/4" wide 116-1/4" deep 113-5/8" high
Construction	Sheet steel
Openings	Front and rear
Car Doors	Sliding, 2 speed
PLATFORM	
Overall Dimensions	8' wide, 11' deep
Construction	Structural steel
Floor covering	Rubber tile
CARFRAME	
Construction	Structural Steel
Type	Corner post
Guides	Roller
Safety	Special type 18D - Governor operated
COUNTERWEIGHT	
Type	Welded frame, cast-iron weights
Guides	Roller
Roping	1:1
Compensation	Rope

TABLE 1-1. PRINCIPAL CHARACTERISTICS

GOVERNOR	
Type	Otis HA, fully enclosed
Operation	Centrifugal
Tripping Speed	840 feet per minute
MACHINE	
Type	Otis 269HT, Gearless Double Wrap Traction
Location	Above at 449'-7"
Motor	
Type	Otis 269
Rating	285 volts no load, 300 volts full load, 355 amp, 130 HP, 74 RPM
Ambient Temperature	50°C
Bearings	Roller
Power Supply	480 Volts, 3 Phase, 60 Cps
Brake	
Model	Otis 269
Type	D-C Magnet
Operation	Spring set, electric release
Ambient Temperature	50°C
Driving Sheave	
Diameter	36 inches
Number of Ropes	8
Rope Diameter	5/8"
Roping	Double-wrap
Grooving	16 round seat grooves for 5/8" ropes
Arc of Contact	339°

TABLE 1-1. PRINCIPAL CHARACTERISTICS

MOTOR GENERATOR SET	
Type	Otis 5B
Rating	
5B Generator	1200 RPM, 70 KW, 315 Volts, 222 Amp, 50° Continuous
30AC Motor	460 Volts, 3 Phase, 60 Cps, 110 HP, 1200 RPM, NE Code Letter K, 130 AMP
73GX Exciter	1200 RPM, 7.5 KW, 120 Volts, 62.5 Amp, 50°C continuous
SECONDARY SHEAVE	
Diameter	36 inches
Grooving	16 round seat grooves for 5/8" ropes
MAIN CONTROLLER	
Type	Otis 73UAL Special
Power Supply	480 volts, 3 phase, 60 cps
Operation	Duplex collective, with and without attendant
Location	Machine room
Ambient	50°C
Duty	Continuous
Protection	Motor and MG set overload
SELECTOR	
Type	Otis 6850BJ
Power Supply	480 Volts, 3 Phase, 60 Cps
Location	Machine room
Number per elevator	Two per elevator (one for front landings, one for rear platforms)
Duty	Continuous
Ambient	50°C

TABLE 1-1. PRINCIPAL CHARACTERISTICS

INTERCOMMUNICATION SYSTEM	Master station in lobby Master station in each machine room Master-master station in LCC building Slave station in each car
ELECTRONIC AND DISPATCHING CONTROLLER	Selects dispatching pattern Indicates power supply failure on LCC Control and Communication Panel Contains hall button power supply
	NORMAL-CONTINUOUS switch. NORMAL position permits MG set to be shut off automatically at a predetermined time after elevator has cleared all registered calls. CONTINUOUS position permits continuous operation of MG set.

TABLE 1-2. EQUIPMENT SUPPLIED

Item	Model Number	Quantity
Elevator Car		
Enclosure		1 per elevator
Platform	6183AE10	1 per elevator
Carframe		1 per elevator
Car Guide Rails	OA	2 per elevator
Roller Guides		4 per elevator
Car Buffer	6136D	2 per elevator
Counterweight		1 per elevator
Counterweight Guide Rails	No. 1	2 per elevator
Roller Guides		4 per elevator
Counterweight Buffer	6136D	1 per elevator
Gearless Hoisting Machine	269HT	1 per elevator
Motor Generator Set	5B	1 per elevator
Motor	30AC	1 per elevator
Exciter	73GX	1 per elevator
Secondary Sheave		1 per elevator
Controller	73UAL, Special	1 per elevator
Extended Panel (where specified)		1 per elevator
Selector	6850BJ	2 per elevator
Electronic and Dispatching Controller		1 per elevator
Governor	HA, Enclosed	1 per elevator
Car Safety	18D, Special	2 per elevator
Door Devices		
Power Door Operator	6970A	2 per elevator
Light Ray Device	6971J	2 per elevator
Rear Car Door Interlock	57-6410E	1 per elevator
Hoistway Door Interlock	6940A	1 per set of doors
Safety Shoe		1 per set of car doors

TABLE 1-2. EQUIPMENT SUPPLIED

Item	Model Number	Quantity
Operating Equipment		
Car Operating Panels		2 per elevator
Car Top Inspection Control Box		1 per elevator
Car Position Indicator		1 per elevator
Landing Button Fixture, Terminal		2 per elev. group
Landing Button Fixture, Interm.		45 per elev. group
Hall Lantern, Terminal		1 per elevator
Hall Lantern, Intermediate		45 per elevator
Hall Position Indicator		1 per elevator
Lobby Control Panel		1 per elev. group
Control and Communication Panel		1 per installation
Pit Emergency Stop Switch		1 per elevator

TABLE 1-3. REFERENCE DRAWINGS

ELEVATOR LAYOUTS	DRAWING NUMBER	FIGURE NUMBER
Sectional Elevations		
Plan Views	302386-ELS	8-1
Elevator No. 1	302386-PN	8-1A
Elevators No. 3 and 4	302386-PN	8-2
Elevators No. 5 and 6	302388-PN	8-4
Elevators No. 9 and 10	301040-PN	8-6
Elevators No. 11 and 12	301042-PN	8-8
Elevators No. 13 and 14	301044-PN	8-10
Elevator No. 15	301046-PN	8-12
Machine Room		
Elevator No. 1	302386-MR	8-1B
Elevators No. 3 and 4	302387-MR	8-3
Elevators No. 5 and 6	302388-MR	8-5
Elevators No. 9 and 10	301040-MR	8-7
Elevators No. 11 and 12	301042-MR	8-9
Elevators No. 13 and 14	301044-MR	8-11
Elevator No. 15	301046-MR	8-13
CAR ENCLOSURE	ZD-27117A-900	8-14
Platform Assembly (2 sheets)	301038-700	8-15
Platform Support Frame (2 sheets)	301038-703	8-16
Carframe and Safety (2 sheets)	301038-708	8-17
Car Safety (2 sheets)	301038-730	8-18
8-inch Roller Guides (2 sheets)	301038-744	8-19
Rope Compensation & Car Hitch (2 sheets)	301038-739	8-20
Door Operator (2 sheets)	301038-800	8-21
Rear Car Door Interlock	301047-355	8-24
Magnetic Interlock Assembly	57-6410E	8-25
Safety Shoe	301038-808	8-22
Light Ray Device	301038-815	8-23
HOISTWAY ENTRANCES - DOORS	ZD-27117-932	8-26
Hoistway Door Interlock (2 sheets)	301038-813	8-27
Counterweight	301038-742	8-28
Oil Buffers (2 sheets)	301038-738	8-29
Governor Assembly (4 sheets)	301038-308	8-30
Governor Enclosure	301038-311	8-31
Governor Rope Tightener (2 sheets)	301038-732	8-32

TABLE 1-3. REFERENCE DRAWINGS
(Cont'd.)

ELEVATOR LAYOUTS	DRAWING NUMBER	FIGURE NUMBER
MACHINE ASSEMBLY (3 sheets)	301038-300	8-33
Machine Foundation Plan	301038-306	8-34
Secondary Sheave	301038-305	8-35
Motor-Generator Set (3 sheets)	301038-307	8-36
Selector Arrangement	301038-346	8-37
Assembly, Fixed Levels (3 sheets)	301038-347	8-38
Assembly, Movable Platforms (3 sheets)	301038-348	8-39
Leveling Cam	6827C	8-40
Leveling Switches	A6851D	8-41
Tape Hitch	301038-743	8-42
Main Controller (5 sheets)	301038-350	8-43
Extended Panel (2 sheets)	302386-302	8-43A
Dispatching and Electronic Controller (4 sheets)	301038-351	8-44
OPERATING EQUIPMENT		
Hall Position Indicator	301038-330	8-45
Hall Lanterns, Intermediate	301047-330	8-46
Hall Lanterns, Terminal	301038-312	8-47
Hall Button Fixture, Intermediate	301038-315	8-48
Hall Button Fixture, Terminal	301038-314	8-49
Car Position Indicator	301038-340	8-50
Car Operating Panel (4 sheets)	301038-316	8-51
Car Top Inspection Control Box	A7003C	8-52
Lobby Control Panel	301038-336	8-53
ELECTRICAL DIAGRAMS		
System Schematic Diagram (8 sheets)	23-A4S6987H	8-54
System Wiring Diagram (2 sheets)	23-A4F6987H	8-55
Light Ray Electrical Diagram	A1S/F6971J	8-56

1-14. The car position indicator is located above the front doors and is described in paragraph 1-103.

1-15. Two car operating panels are provided in each elevator car. The main panel, located next to the front doors, consists of a telephone cabinet, service cabinet, and electronic touchbutton panel. The auxiliary panel, located next to the rear doors, consists of the identical electronic touchbutton panel and an intercom cabinet. The car operating panels are described in paragraphs 1-104 through 1-108.

1-16. The car is ventilated by a pair of blowers mounted on rubber pads along the centerline of the ceiling. Air is taken in from the hoistway through a mesh, passed through a short duct, and forced out through a grille at the top of the car. The mesh is designed to withstand the air pressure built up by the ascending car. Both ventilators are turned on and off by a keyswitch in the service cabinet section of the main car operating panel.

1-17. The light trough, recessed into the perimeter of the ceiling, contains six 40- and six 14-watt fluorescent lamps. Car lights are turned on and off by a keyswitch in the service cabinet section of the main car operating panel.

1-18. PLATFORM

1-19. The platform (Figures 8-15 and 8-16) supporting the car consists of a steel floor plate welded to a structural steel frame. This steel frame consists of end and side channels to which are welded 10 stringer channels. A toe guard and threshold plate is provided at each entrance. The floor plate is covered with 3/16-inch rubber tile. The platform measures 8 by 11 feet, overall.

1-20. CARFRAME

1-21. The carframe (Figure 8-17) which supports the car and platform, consists of a structural steel frame of four members. The lower horizontal member runs diagonally beneath the platform, the upright members are located at the corners of the car, while the crosshead or upper horizontal member is located several feet above the top of the car and parallel to the lower member. For sound and vibration isolation, car and platform rest on eight rubber blocks mounted on the lower horizontal member. At the top, the car is held to the upright members of the carframe by rubber-faced clamps that are welded to each side of the car canopy. Lateral and upwards motion of the car is restrained by "locking" blocks but there is no metal-to-metal connection between the car and the carframe.

1-22. Attached to the carframe are two safety clamps, one at each end of the lower member (see paragraph 1-38 for description), and two upper and two lower roller guides for controlling the movement of the car up and down the guide rails in the hoistway. The crosshead mounts a hitch plate for attaching the hoist ropes.

1-23. HOISTWAY

1-24. HOIST ROPES

1-25. The eight 5/8-inch steel hoist ropes are fastened to the hitch plate on the carframe crosspiece. Each rope leads from its car hitch, up to the top of the hoistway, once around the machine driving sheave (in the machine room), down around the secondary sheave, and off the top of the driving sheave down to its counterweight hitch. The hoist ropes are deflected into the hoistway by the secondary sheave.

1-26. COUNTERWEIGHT

1-27. The counterweight (Figure 8-28) consists of a structural steel frame with cast iron middle weights, upper and lower guides, and a hitch plate for eight ropes. With the 29 cast-iron weights specified, the counterweight weighs 14,210 pounds-- the weight of the car plus 42.5% of the weight of the rated capacity load.

1-28. GUIDE RAILS AND ROLLER GUIDES

1-29. Counterweight motion in the hoistway is guided by two upper and two lower roller guides which slide on "T" rails along the side wall of the hoistway. Each guide consists of three rollers-- one riding on the front face of the rail, the other two riding on the side faces. Spring pressure holds each roller against the rail face.

1-30. Car motion in the hoistway is guided by upper and lower roller guides (Figure 8-19) which run on two "T" rails, the rails being located in opposite corners of the hoistway. The roller guides located on the upper and lower members of the carframe are identical in function to those employed on the counterweight.

1-31. TRAVELING CABLE AND ROPE COMPENSATION

1-32. TRAVELING CABLE. A multi-wire electrical cable connects the car to the machine room. The cable runs from a junction box at the bottom of the car to a junction box on the wall approximately halfway up the hoistway. The cable moves with the car and hence is called the "traveling cable".

1-33. ROPE COMPENSATION. The effect of hoist rope weight on hoist-motor load varies with the position of the car. With the car at the top landing the rope weight is on the counterweight tending to pull up the car. At the main landing the rope weight tends to pull up the counterweight.

1-34. Compensating ropes, plus the weight of the traveling cable, tend to even out the loading effect of the hoist ropes. The compensating ropes run from a hitch on the bottom of the car to a compensating sheave (Figure 8-20) and frame in the pit and thence to the counterweight. The compensating sheave frame (3) is mounted on a 47-inch vertical rail (7) secured to a bracket (8). A limit switch on the rail is actuated by a tripper (4) to stop the elevator if the frame is pulled up to its upper limit of travel.

1-35. HOISTWAY LIMIT SWITCHES AND STOPPING CAMS

1-36. Stopping switch SS slows and stops the elevator motor at the terminal landings independent of the normal stopping sequence. The switch consists of a box of contacts mounted on the carframe and an actuating arm. As the car approaches a terminal, the arm rides along the hoistway-mounted cam, operating the following switch contacts in sequence.

Name	Bottom Landing	Top Landing
First Slowdown	SS1	SS2
Second Slowdown	SS7	SS8
Third Slowdown	SS5	SS6
Stopping Contact	SS9	SS10

1-37. The final limit switch at each terminal landing cuts off power if the elevator runs beyond the normal limit of travel. Limit switch 1LS is mounted at the bottom landing, 2LS at the top landing. Limit switches are actuated by a cam on the carframe.

1-38. GOVERNOR AND CAR SAFETY

1-39. The governor, car safety, and associated components make up the elevator safety system. The purpose of this system is to stop the elevator -- independently of the hoisting mechanism -- if car speed becomes excessive.

1-40. GOVERNOR. The flyball governor (Figure 8-30) is located in a sheet steel enclosure (Figure 8-31) at the top of the elevator hoistway. In operation, the governor is driven by an endless steel rope which passes over the governor sheave, attaches directly to the elevator car, and is held at the lower end by a tension sheave (Figure 8-32) mounted in the elevator pit. As long as the elevator operates at its rated speed of approximately 700 FPM, the governor has no effect on the operation of the elevator. If the car speed reaches 750 FPM, centrifugal motion of the flyball weights raises a connecting linkage, actuating the 6098B switch which controls the field winding of the drive motor so as to reduce car speed. If the car speed reaches 795 FPM, the further outward motion of the flyball weights raises the connecting linkage higher, opening the A6098D switch which cuts off power to the drive motor and applies the brake.

1-41. If this action still does not retard the downward travel and the car's speed reaches 840 FPM, the governor trips the clamping jaws which then grip the steel governor rope with sufficient force to exert a controlled upward pull on the rope and thus operate the car safety.

1-42. CAR SAFETY. The car safety (Figure 8-18) consists of two safety clamps (one per guide rail) bolted to the bottom member of the elevator carframe and connected by a system of rods and linkages. Each safety clamp has two steel jaws to grip the guide rail and a heavy spring to regulate the pressure exerted by the jaws.

1-43. When the elevator car is traveling at less than 840 FPM, the jaws remain in the "ready" position where they do not touch the rails. If the elevator's downward speed reaches 840 FPM, the governor trips, exerting an upward pull on the lift rods. The lift rods in turn "set" both safety clamps on the elevator car and bring the wedge-shaped safety jaws in contact with the guide rails. Further motion of the car causes these movable jaws to wedge themselves between the rail and the arms of the clamps until sufficient clamping force is exerted by the heavy safety springs to bring the car to a smooth stop.

1-44. The car safety will also stop the car quickly-- and independently of speed action by the governor-- in the event of sudden, rapid acceleration in the down direction, such as would be caused by a parting of the hoist ropes. When such acceleration occurs, the inertia of the governor rope system resists the sudden downward motion with sufficient force to raise the lift rods and operate the safety.

1-45. CAR AND COUNTERWEIGHT BUFFERS

1-46. Spring-return, oil-filled buffers (Figure 8-29) located in the elevator pit are designed to bring the car or counterweight to a smooth stop if it exceeds the lower limit of travel. They are built to absorb the impact of a fully loaded car or counterweight descending at full rated speed. (Oil buffers are not designed to stop falling cars. In the remote possibility that a car should fall, the car safety described in paragraph 1-38 will stop the car before it reaches the buffer.) Two 33-1/2-inch stroke car buffers and one 33-1/2-inch stroke counterweight buffer are supplied.

1-47. The buffer consists of a spring-loaded plunger which fits into an oil-filled cylinder. If the descending elevator car (or counterweight) over-travels the lower limit, a heavy steel plate under the carframe strikes a rubber contact block on the top of the steel plunger. This rubber block absorbs the first shock of contact. Further descent of the car drives the steel plunger into the oil-filled inner cylinder. This forces the oil through the escape holes in the side of the cylinder, and produces sufficient oil pressure to retard the descent of the car and bring it to a smooth stop. When the car is lifted from the buffer, a compression spring returns the plunger to its normal position at the top of the cylinder. This permits the oil to flow from the reservoir back through the escape holes into the inner cylinder and the buffer is again ready to function.

1-48. POWER-OPERATED CAR AND HOISTWAY DOORS

1-49. DOOR OPERATION

1-50. DOOR OPERATOR AND HOISTWAY DOOR INTERLOCK. A power door operator (Figure 8-21) opens and closes both the car and hoistway doors simultaneously. The door operator consists of a 1/2-horsepower electric motor, a gear reduction unit, an internal hydraulic damping mechanism, and external power linkage. The power linkage is connected to the fast car door.

1-51. The hoistway door is opened by means of a vane or cam attached to the fast car door. The cam slides between the roller in the hoist door interlock (detail "H", Figure 8-27) mounted at the top of the hoist door as the car is brought to a stop at the hoistway level. When the fast car door begins to open, the cam pushes against one of the rollers, unlocking the hoistway door interlock and pulling the hoistway door open. The cam remains engaged by the roller throughout the opening operation, so that both car and hoistway doors open together. As the fast doors are opened, a cord and pulley arrangement pulls open the slow door at the same time. When the doors near the fully open position, a rod driven from the power arm operates a switch lever, reducing power to the door operator. The doors slow down near the fully open position, are brought to a stop by rubber bumpers.

1-52. The doors remain open for a predetermined period of time, (on automatic operation) or until the attendant presses his control button. This closes the reverse power circuit for the door operator and the door begins to close. Again, both car and hoistway doors move simultaneously. At the end of the travel, the hoistway door interlock is closed. The car cannot be started until this interlock is secured. Closing of this interlock also prevents the hoistway doors from being opened from the landing side. Complete closing of the hoistway doors is assured by the positive action of the independent door closing weights.

1-53. In case of power failure, the front doors can be opened manually from within the car. The passenger (or attendant) inserts his hand between the door jamb and the flexible rubber door edge and pulls open both the car and hoistway doors. Doors should be opened manually only if the car is at a landing. Should power fail when the car is between floors, use intercom to summon aid. If necessary, maintenance personnel will help passengers to leave the car by means of the emergency exit in the ceiling.

1-54. DOOR SAFETY DEVICES

1-55. CAR DOOR SAFETY SHOE. A flexible rubber section mounted on the front edge of the fast car door (Figure 8-22) conceals a reversing switch. If the flexible rubber section touches a passenger or obstruction, the projecting shoe yields and makes an electric contact which causes both car and hoistway doors to reverse to the open position.

1-56. LIGHT RAY DEVICES. Two light rays (Figure 8-23) at ankle height and waist height are beamed across the elevator entrance and focused on photocells on the other side of the doorway. A passenger entering or leaving the car interrupts a light ray and prevents the doors from closing. If the doors have started to close, interruption of either ray will reopen the doors.

1-57. If the car doors are held open for longer than a pre-set time due to operation of either the light ray or the safety shoe, a timing relay will close an alarm buzzer circuit in the car. The buzzer will sound until the door obstruction is removed.

1-58. REAR CAR DOOR MAGNETIC INTERLOCK. A magnetic interlock (Figures 8-24 and 8-25) prevents the rear car doors from opening except when the elevator has stopped at one of the movable platform levels. The interlock consists of a magnetically-actuated bolt mounted on the car-door header and a striker plate mounted on the fast door hanger. Until the elevator has stopped at a movable platform level, the coil is de-energized, the bolt is extended through the opening in the striker plate, and the door is thereby locked. When the elevator stops level with a movable platform, the coil receives power, the bolt is pulled back, and the car doors can be opened.

1-59. HOISTING MACHINE, MOTOR GENERATOR AND SECONDARY SHEAVE

1-60. HOISTING MACHINE

1-61. The gearless traction elevator machine (Figures 8-33 and 8-34) consists of three main components - a direct current motor, a driving sheave and a brake. The sheave rim and brake pulley is a one-piece casting which is shrunk on and bolted directly to the armature shaft. The armature shaft is supported by a front and rear bearing stand. The bearing stands and motor field frame are bolted to a common bedplate.

1-62. MOTOR. The d-c motor is rated 285 volts no load, 300 volts full load, 355 amperes, 130 horsepower, 74 RPM and has a motor field running current of 23.4 amperes. The motor standing field strength is approximately 40 to 50 percent of the running field.

1-63. The hoisting machine speed of rotation is proportional to the voltage impressed on its armature. An armature current, of voltage varied to produce the required elevator speed and acceleration, is supplied by the motor-generator set.

1-64. TRACTION SHEAVE. The traction sheave is 36 inches in diameter, grooved to make contact with the round 5/8-inch hoist ropes over a 339° arc. The 16 grooves permit each of the eight hoist ropes to be wrapped twice about the top of the sheave. Rotation of the sheave by the drive motor supplies the force that moves the elevator car up and down the hoistway.

1-65. BRAKE. Twin brake arms (84), pivoted at the base of the rear bearing stand, hold the cast iron brake shoes (85) against the brake pulley by spring pressure. The brake is released by a d-c operated solenoid (68) mounted atop the rear bearing stand.

1-66. The solenoid consists of a magnet coil wound concentric with a split core. To release the brake, direct current is impressed on the coil, drawing together the two halves of the core, causing link (74) and lever (75) to pull the brake arms away from the brake pulley.

1-67. As the brake releases, core motion operates brake switch (48) through lever (70). Brake solenoid current is reduced from the level required to operate the solenoid to the level required to hold the brake released. This is done so brake application will not be slowed by the collapse of a large number of magnetic flux lines.

1-68. As the car begins leveling into a landing, solenoid current is reduced still further. The cores separate enough so that the brake shoes are pressed lightly against the brake pulley, slowing but not stopping the elevator. This is known as "drop-hold" brake operation. When the brake is finally applied by cutting off all solenoid power, the brake shoes are pressed firmly but smoothly against the brake pulley as the remaining flux lines collapse. Then, a capacitor is discharged quickly through the solenoid, momentarily lifting the brake. These actions bring the car to a quick but smooth stop.

1-69. MOTOR-GENERATOR SET.

1-70. The motor-generator set (Figure 8-36) supplies a variable level of d-c power to control the speed and acceleration of the hoisting machine drive motor and a fixed level of d-c power for main controller operation. The set consists of an a-c motor, d-c exciter, and d-c generator mounted on vibration-isolating rubber pads in the machine room.

1-71. A-C DRIVE MOTOR. The a-c motor drives both the exciter and generator at a constant speed. It is rated at 460 volts, 3 phase, 60 cycles, 110 horsepower, 1200 RPM, NE code letter K, 130 amperes, 50°C continuous duty.

1-72. D-C EXCITER. The d-c exciter produces 120 volts at 62.5 amperes for the operation of main controller circuits. It is rated at 7.5 kilowatts, 1200 RPM, 50°C, continuous duty.

1-73. D-C GENERATOR. The generator provides the hoist motor power. It is rated at 1200 RPM, 70 kilowatts, 315 volts, 222 amperes, 50°C, continuous duty.

1-74. The generator armature rotates at a constant 1200 RPM. The three generator fields - shunt, leveling, and compensating - are varied in strength by the main controller. Generator output voltage is a function of combined field strength.

1-75. The shunt field is excited during elevator main operation, i.e., during acceleration, high-speed run, and deceleration. The direction of current flow through this field also determines whether the elevator travels up or down. The closing of "speed" switches, in timed sequence, removes series resistance from the shunt field, increasing generator output voltage and causing the elevator to accelerate. Similarly, series resistance is inserted by speed switches during deceleration. At the last step of deceleration, the shunt field is disconnected and the leveling field is excited.

1-76. The leveling field provides the reduced output voltage required to bring the elevator to a controlled stop, level with the landing. Leveling switches on the selector operate relays which gradually add series resistance to the leveling field, slowing the elevator to a smooth stop.

1-77. The leveling field is also used to return the car to a level position if it moves away from the landing as passengers enter or leave the elevator. This operation is called "releveling". Finally, the leveling field is used as the first step of acceleration and, as mentioned above, the last step of deceleration.

1-78. The compensating field, in conjunction with the load-weighing switches beneath the car platform, opposes or "bucks" the shunt field, thus adjusting elevator speed for light or heavy car loads. If the car is heavily loaded, the compensating field will slow the car on the down trip and speed it (or at least provide additional torque) on the up trip. Conversely, the compensating field speeds a lightly loaded down car (that is, it increases the speed of the up-traveling counterweight which is heavier than the car at this time), and slows a lightly loaded car.

1-79. SECONDARY SHEAVE

1-80. The secondary sheave (Figure 8-35) is located just beneath the traction sheave and serves to deflect the hoist ropes into the hoistway. The sheave is 36 inches in diameter and is grooved with a round seat for sixteen 5/8-inch ropes.

1-81. SELECTOR, ELECTRONIC AND DISPATCHING CONTROLLER, AND MAIN CONTROLLER

1-82. These three units control the starting, stopping and movement of the elevator. All three units are located in the machine room.

1-83. SELECTOR

1-84. Control of a high-speed elevator requires knowledge of (1) the present location of the elevator and (2) the location of the next stop. The selector (Figures 8-37 and 8-38) in effect a scaled miniature model of the hoistway, provides this information and, in so doing, initiates and coordinates all elevator operations.

1-85. The selector consists of an upright frame representing the hoistway, horizontal floor bars representing the landings served, a small "car"

called a crosshead which travels up and down in synchronism with the elevator car, and an "advancer panel" which travels ahead of the crosshead.

1-86. Crosshead location at any instant represents car location in the hoistway. As the crosshead travels up and down, its brushes engage contacts on the floor bars which light position indicators in the car, on the main landing, and on the control and communication panel in the LCC building. As the top and bottom landings, crosshead brushes initiate elevator reversal.

1-87. The advancer panel travels up and down the selector always ahead of the crosshead, until it reaches a floor for which a call is registered. It then stops and performs the following functions:

a. Lights hall lanterns
b. Turns off landing button
c. Initiates stopping sequence

1-88. The selector also contains leveling cams and switches (Figure 8-38, Sheet 2), which accurately control the final car deceleration sequence so that the car stops smoothly, level with the landing. One "pie" or wedge-shaped leveling cam is provided for each landing (Figure 8-40). The cams are mounted on a vertical shaft and rotate with the motion of the elevator. The cam-actuated leveling switches are mounted on a ring, concentric with the cams, spaced around the ring at positions which represent given distances from the landing (Figure 8-41). The leveling ring is moved up and down with the crosshead. As the car approaches a landing, the leading edge of the leveling cam picks up all the leveling switches. Elevator speed is reduced at preset distances from the landing as the contacts drop off the trailing edge of the cam, one by one, disconnecting leveling switches in sequence.

1-89. Two selectors are provided for each elevator - one with 37 floor bars for the front (fixed) levels, and another with 10 floor bars for the rear (adjustable) platforms, (Figure 8-39). The front selector is driven directly by the elevator car through a steel toothed tape. The tape is threaded over a 16-inch driving sheave on the selector, and an idler sheave in the pit; one end of the tape is connected to the top of the car, the other end of the bottom of the car. The "rear" selector is driven 1:1 from the "front" selector trhough a "bicycle chain" - and-sprocket arrangement.

1-90. MAIN CONTROLLER

1-91. The main controller (Figure 8-43) contains all the circuitry needed to start and stop the elevator machine, determine its direction of travel, regulate its rate of acceleration and deceleration, and control its running speed. In addition, the controller performs such other functions as protection of the motor against damaging overloads.

1-92. The controller relays are each mounted on an individual panel fastened to a frame enclosed in a steel cabinet. For a sequence of controller operation, see Section III.

1-93. ELECTRONIC AND DISPATCHING CONTROLLER

1-94. The electronic and dispatching controller (Figure 8-44) is, in effect, an auxiliary controller. It contains circuits for automatically selecting the dispatching pattern (up peak, down peak, up-down, or intermittent) in response to prevailing traffic conditions. In performing its dispatching functions, it determines whether calls have been in continuous registration for 90 seconds, whether the motor-generator set is in operation, and which direction of traffic is predominant. It also contains circuits for automatically dispatching a car on an emergency basis if the normal dispatching fails.

1-95. The electronic and dispatching controller also contains the hall-button power supply, and a circuit that causes the elevator to make a series of preselected stops if the hall button power supply fails. It also closes a permissive circuit that permits connection of emergency power in case the motor-generator set and machine lose normal power.

1-96. OPERATING AND SIGNALING EQUIPMENT

1-97. HALL POSITION INDICATOR, HALL LANTERNS AND HALL BUTTONS

1-98. HALL POSITION INDICATOR. A hall position indicator (Figure 8-45) is located above each elevator entrance on the first landing. It indicates the direction in which the elevator is traveling (up arrow lights green, down arrow lights red), and the landing at which the car is stopping or passing. Fixed landings are indicated by numerals 1 through 37, adjustable platforms by the letters A through H, J and K; both letters and numerals light white. Arrows, numerals, and letters are cut out of the satin-finish stainless steel faceplate and covered by a translucent plastic

jewel of the appropriate color. Each lamp is shielded so that only one jewel is illuminated at a time.

1-99. HALL LANTERNS. A hall lantern (Figure 8-46) is surface mounted above each elevator entrance door, except those on the first landing. It indicates that the elevator car is approaching a stop at that landing as well as the direction the car is traveling. (Up arrow lights green, down arrow lights red. A single stroke gong sounds when the arrow is illuminated.) The arrows are cut out of a satin finish stainless steel plate and covered by an appropriately colored plastic jewel.

1-100. Hall lanterns at the uppermost landing (Figure 8-47) contain a single red arrow. The hall position indicator described above takes the place of the hall lantern on the first landing.

1-101. HALL BUTTON FIXTURE. A hall button fixture (Figures 8-48 and 8-49) is located at each landing, the one fixture serving both elevators. It consists of an up and a down electronic touchbutton at each intermediate landing, and a single button at each terminal landing. When the "button" is touched, the capacity existing between the passenger and ground causes a cold cathode tube to ignite, signaling the call and causing the button to light. After the elevator arrives, the cold cathode tube is de-ionized and the button goes dark. The plastic buttons are mounted on a satin finish stainless steel faceplate. Each individual button has an opaque center mounted in translucent plastic that glows brightly when the electron tube behind the button lights up.

1-102. CAR POSITION INDICATOR, CAR OPERATING PANELS

1-103. CAR POSITION INDICATOR. A car position indicator (Figure 8-50) is located above the front doors in each passenger car. This unit is identical in function and appearance to the hall position indicator described above, except for the absence of directional arrows.

1-104. CAR TOUCHBUTTON OPERATING PANEL. The two touchbutton panels (Figure 8-51) supplied for each car are physically identical. A call registered on one panel registers automatically on the opposite panel. Each touchbutton panel contains the following controls:

a. Front Door Open (FDO) pushbutton used by the passenger to hold the front car and hoistway doors open when the car has stopped at a landing.

b. Front Door Close (FDC) pushbutton used by the passenger to cause the front doors to close. This button is effective only when the elevator is placed in independent service by a switch in the service cabinet (paragraph 1-105).

c. Rear Door Open (RDO) pushbutton. Same as FDO, but for rear doors.

d. Rear Door Close (RDC) pushbutton. Same as FDC, but for rear doors.

e. Red emergency STOP push switch used by passenger to stop car. Prevents operation of car, but does not cancel registered calls. After elevator has been returned to service (by pulling STOP switch out to its normal position), the car continues to answer calls.

f. Black EMERG. CALL pushbutton used to sound an emergency signal bell in the hoistway at the main lower landing and in the LCC building.

g. One electronic pushbutton for each landing served by the elevator. Fixed landings (front) are numbered from 1 through 37, adjustable landings (rear) are lettered A through H, J and K. Touching button registers a call for that landing, as indicated by the lighting of the plastic area around the numeral or letter. When the elevator arrives at the called landing, the touchbutton light goes dark.

1-105. SERVICE CABINET. The service cabinet (Figure 8-51) contains the following controls for use by the attendant:

a. Up dispatching light (green jewel with arrow) which lights (at the same time as a soft-tone gong sounds) to inform the attendant that it is time to leave the lower dispatching terminal. The dispatching light remains illuminated until the highest call is answered.

b. Down dispatching light (red jewel with arrow) which dispatches the car from the upper dispatching terminal. The down dispatching light goes out as the car leaves the landing.

c. Loading light (letter L with white jewel) which is illuminated when the car is at a dispatching terminal and is designated to be the next car to leave that terminal. It tells the attendant to receive passengers. The loading light is extinguished when the dispatching light comes on.

d. NON STOP pushbutton is held in by the attendant to cause the car to run "express", bypassing all registered landing calls. The car will, however, continue to respond to calls registered on its own operating panel.

1-106. The following controls are available to the attendant and to maintenance personnel when the door to the service cabinet is unlocked:

a. Five load test lights (white jewels) which are used in the testing and adjusting of the automatic load weighing devices located on the underside of the elevator car.

b. LIGHT OFF toggle switch used to operate the fluorescent lights in the car.

c. Independent Service toggle switch which, in the IND SERVICE position, permits independent control from the car without interference from hall calls. In GROUP position, car is operated by the group supervisory system.

d. Front and Rear MONITOR OFF toggle switches which permit disconnecting the light-ray devices at the front and rear car entrances, respectively.

e. FAN OFF toggle switch used to turn the car ventilating fans on and off.

f. Inspection toggle switch which, in INSP position, cuts off both landing and car operating buttons.

g. AUTO-ATT toggle switch which is placed in the ATT position when the car is to be operated by an attendant.

h. Telephone jack into which a telephone can be plugged for use during elevator service and test periods.

1-107. TELEPHONE CABINET. The telephone cabinet (Figure 8-51) is the upper section of the main car operating panel. It is recessed into the car wall and is designed to accommodate the telephone company's No. 322 instrument. The hinged cabinet door is provided with a latch and with a knob cast and filled with the word "PHONE". The upper portion of the door panel contains a glass-faced certificate frame.

1-108. INTERCOM CABINET. The intercom cabinet (Figure 8-51) is the upper section of the auxiliary car operating panel. It is recessed into the car wall and contains the two-way speaker-microphone unit that permits conversation between the passengers in the car, the lobby attendant, the machine room, and the control and communication panel in the LCC building. The cabinet is equipped with a hinged perforated door which can be locked.

1-109. CAR TOP INSPECTION CONTROL BOX

1-110. An inspection control box (Figure 8-52) mounted on the car crosshead, contains the following equipment:

a. An INSPECTION toggle switch. With CAR TOP keyswitch (in front car operating panel) turned to INS position, throwing toggle switch to INSPECTION position, transfers control of elevator operation to the car top inspection control box.

b. An unmarked control inspection button and two operating buttons marked U and D. Holding the control button and either one of the operating buttons depressed causes the elevator to travel at reduced speed in the selected direction.

c. A PUSH TO STOP - PULL TO RUN button. Pressing this button stops all elevator operation until is is pulled out to its normal position. This button is always effective.

1-111. PIT EMERGENCY STOP SWITCH

1-112. A red emergency STOP button, identical in function to those in the car operating panel and car top inspection control box, is mounted in the elevator pit.

1-113. LOBBY CONTROL PANEL.

1-114. The lobby control panel (Figure 8-53) is located on the lower terminal landing. One lobby control panel is supplied for each pair of elevators. The flush-mounted stainless steel panel contains the following components:

a. A master intercom unit, consisting of a speaker-microphone behind a grille, VOLUME control, PUSH TO TALK switch, and 12 selector buttons. The starter presses the selector pushbutton for the elevator with which he wishes to communicate and then presses the PUSH TO TALK button. He can also talk with the master-master unit in the LCC building.

b. A STOP-START GENERATOR key-operated switch for each elevator in the group. When the elevator is parked at the lower terminal and is to be taken out of use, this switch is placed in STOP; the doors close and the motor-generator is shut down. To place a car in service, the key is set to START; the doors open and the motor-generator will start when the first call is registered.

c. A white indicator lamp for each elevator in the group. White jewel is engraved with number of elevator. Lighting of jewel indicates that motor-generator is in operation.

d. A telephone handset is located behind each lobby control panel. The telephone cabinet can be locked to prevent unauthorized use of the telephone.

1-115. CONTROL AND COMMUNICATION PANEL

1-116. The control and communication panel is located in the LCC building. The flush-mounted, stainless steel panel contains the following components:

a. STOP-START GENERATOR keyswitch for each high-bay elevator. Turning this switch to START opens the car doors. Motor-generator set will be energized when a call is registered.

b. A pair of direction arrows for each elevator, indicating whether it is traveling up or down.

c. Up (U) and down (D) dispatching lamps, connected in parallel with the corresponding arrows on the main car operating panel.

d. A position indicator for each elevator with numbers 1 to 37 for front landings and the letters A through H, J and K for rear platforms.

e. NORMAL POWER SUPPLY light for each elevator energized as long as normal power is available.

f. EMERGENCY POWER SUPPLY light for each elevator, lighted when Emergency Power Supply keyswitch for that elevator is operated.

g. One Emergency Power Supply keyswitch for each high-bay elevator. However, only two keys are supplied for all 16 elevators so that only two elevators can receive emergency power at any time.

h. An OUT OFSERVICE light for each elevator which lights when the motor-generator set is turned off.

i. Four dispatching pattern lamps for each elevator group which indicate whether the group is operating on an INTERMITTENT, UP-DOWN, UP PEAK or DOWN PEAK program.

j. A switch to permit manual or automatic-selection of traffic pattern for each elevator group.

k. A set of waiting passenger indicator lights for each elevator group which light to show the location of unanswered hall calls.

l. A dispatch Failure warning light for each elevator group. Lights when either emergency dispatch or emergency service is in operation.

m. An EMERGENCY SERVICE keyswitch to call the car, non-stop, to the main landing.

1-117. This panel is illustrated and described in Volume V of this handbook.

SECTION II

OPERATING INSTRUCTIONS

2-1. GENERAL

2-2. The elevator operates between ground level and the 419-foot, 9-inch level with 37 stops at the front of the hoistway and 10 stops at the rear.

2-3. The elevator is arranged to operate either automatically or with an attendant. A keyswitch is provided in the car operating panel to select the mode of operation.

2-4. Call buttons are provided at each landing to permit a passenger, by momentarily touching the button, to register a call and indicate the desired direction of travel. Illumination of the selected button indicates that the call has been registered.

2-5. Call buttons are provided for each landing in the car operating panel which permit either the passengers (on automatic operation) or the attendant to select the landings at which the elevator is to stop. Selection is made by touching the button; selected buttons illuminate to indicate that the call has been registered.

2-6. AUTOMATIC OPERATION

2-7. AUTOMATIC DISPATCHING

2-8. GENERAL. The dispatching operation - the closing of the doors and the departure of the car from the terminal - is initiated automatically by the group supervisory control system. This system coordinates the movement of the individual cars (two per group) so that frequency and direction of elevator service are constantly matched to the existing traffic pattern.

2-9. Cars are selected for dispatching on the following basis:

a. When a single car is waiting at the terminal, it is selected by the group supervisory control system as the car to be dispatched.

b. When both cars are waiting at the terminal, one car is automatically selected on a clockwise, rotational basis.

c. When neither car is waiting at the terminal, the supervisory system selects the first car to arrive.

2-10. Note that cars are dispatched on the basis of availability, not in predetermined sequence. A car delayed enroute (e.g., because of the number of stops selected by the passengers) can be passed by the other car in the group without disrupting dispatching signals. Thus, a car that happens to make a fast trip is not held back by a car that is delayed and makes a slow trip.

2-11. The group supervisory system continuously surveys the pattern of passenger traffic throughout the day and adjusts the elevator dispatching pattern accordingly. Number of landing calls, passenger waiting time, car load, time of car arrivals, round trip time, and relationship of Up and Down trip times -- are fed into the Electronic and Dispatching Controller and used as the basis for selecting one of four dispatching patterns -- Up Peak, Down Peak, Up-Down, and Intermittent. Peak programs are put into operation when the rush occurs at the beginning and end of a shift. If Up Peak or Down Peak traffic occurs during other times of the day, however, the required peak program is initiated automatically.

2-12. With the Program Selector switch (a keyswitch on the control and communication panel in the LCC building) set at AUTOMATIC, the supervisory system will automatically select the dispatching pattern to meet the demand, changing the dispatching pattern as often as required. If manual selection of program is required, the Program Selector keyswitch can be turned to one of the four programs. A description of the four programs appears in the following paragraphs and the principal operating features of each program are summarized in Table 2-1.

2-13. UP PEAK PROGRAM. During the "get to work" rush, maximum Up traffic demands are placed on the elevators. Passengers tend to accumulate in the lobby; heavy Up traffic from the main floor must be accommodated. There are very few Down or inter-floor passengers during this period, so the time spacing of cars is less important than obtaining maximum handling capacity.

2-14. To distribute the largest number of persons from the main floor to the other floors in the shortest time, the following operating features are initiated:

a. Cars are time dispatched from the lower terminal only. This assures a given frequency of Up service.

b. Car is down dispatched as soon as it has discharged last passenger on up call.

c. Car is up dispatched from lobby as soon as it is full.

2-15. DOWN PEAK PROGRAM. During the Down Peak, traffic accumulates at intermediate floors. There is little or no Up traffic. To empty the building quickly, while assuring that passengers on the lower floors are not bypassed by filled elevators, the following operating features are initiated:

a. Cars are time dispatched from the upper terminal (i.e., top floor only. This assures a given frequency of Down service.

b. Cars are instant dispatched from the lower terminal (i.e., main floor) -- cars start back up as soon as passengers are discharged.

c. An empty late car approaching the upper terminal does not complete its Up trip. It is Down dispatched at the highest down call or at the nearest landing if it is above the highest down call.

d. Full cars run express.

e. When passengers on lower floors are being bypassed by express cars, the building is divided into a high and a low zone, each elevator serving one zone. The low zone elevator gives exclusive service to passengers on the lower floors. The high zone elevator serves all floors on the way up and will stop to answer low zone calls on the way down until filled.

2-16. UP-DOWN (OFF PEAK) PROGRAM. Traffic is approximately equal in both directions in the interval between shift changes. To provide regular and frequent service in both directions for all floors, the following operating features are initiated:

a. Cars are time dispatched from both upper and lower terminals, one car leaving the upper terminal at the same time as the other car leaves the lower terminal. This assures a service balanced in both directions.

b. If calls exist behind one car, the other will be dispatched earlier than scheduled to answer these calls.

c. An empty late car approaching the upper terminal will be reversed at the highest down call or the nearest landing.

d. A full car is run express and bypasses hall calls until its load has been decreased by letting off passengers.

2-17. INTERMITTENT PROGRAM. Light, intermittent traffic is usually encountered at night, on Sundays, and on holidays. Cars are parked at the lower dispatching terminal with doors closed and motor-generator sets stopped.

a. When a call is registered, the motor generator of one car starts and that car responds to the call.

b. If one or more calls remain unanswered for a predetermined time while the first car is answering calls, the motor-generator set of the second car will respond to the call.

c. In selecting a car for dispatching, the group supervisory system gives preference to an available car with its motor-generator set running.

d. Both cars reverse at highest call.

e. After answering call, the car returns to the lobby and waits with doors open and landing position indicator illuminated. If no call is registered after approximately 2 minutes, the doors close, the landing position indicator goes out, and the motor-generator set is shut down.

f. If traffic demands become heavy -- group of overtime workers leave or extra shift placed in service -- the group supervisory system will automatically change from the Intermittent program to the program required to handle the traffic demand. The transfer from Intermittent to one of the Peak programs will occur whenever hall calls are in continuous registration for a 90-second interval.

TABLE 2-1. OPERATING FEATURES OF AUTOMATIC DISPATCHING PROGRAMS

DISPATCHING AND OPERATING FEATURES	TRAFFIC PROGRAM			
	Up Peak	Down Peak	Up Down	Int.
TIMED (SCHEDULED) DISPATCH. Cars dispatched at regular intervals. If one car is delayed, following car is still dispatched at scheduled time. Dispatch interval adjusted automatically to meet traffic conditions; more frequent service during heavier traffic.	From Lower Term. only	From Upper Term. only	From both Terms.	-
INSTANT DISPATCH. Car dispatched as soon as it reaches terminal and unloads its passengers.	From Upper Term.	From Lower Term.		
HIGHEST CALL RETURN. Car is down-dispatched after discharging passenger at highest call.	Yes	-	-	-
LATE CAR REVERSAL. Late car approaching upper terminal will be reversed at the highest down call or the nearest landing.		Yes	Yes	
FULL CAR. On down trip, full car runs express, bypassing hall calls until load is decreased. On up trip, car leaves lower terminal as soon as it is filled, bypassing hall calls until load is decreased.	Yes	Yes	Yes	Yes
ZONE RETURN. Zone Return feature goes into operation if accumulated waiting time at lower floors reaches a predetermined limit. (In heavy down traffic, cars tend to fill at upper floors, bypass lower floor calls.) With Zone Return, building is divided into two zones -- a high and a low zone -- and an elevator is assigned to serve each zone. Cars reverse at the highest call in their respective zones. Unfilled high zone cars will answer low zone calls until filled. High zone car answers calls in both zones on way up.	-	During very heavy down peak	-	-

2-18. AUTOMATIC CAR OPERATION

2-19. SWITCH SETTINGS. At the control and communication panel in the LCC building, the Program Selector switch for that group of elevators is set to AUTOMATIC and the STOP-START GENERATOR keyswitch for each elevator in the group is set to START. On the lobby control panel, both STOP-START GENERATOR keyswitches are set to START. In the machine room, the NORMAL-CONTINUOUS switch on the electronic and dispatching controller is set to NORMAL. In the elevator car, controls in the service cabinet of the main car operating panel are set as shown below:

Control	Setting
AUTO-ATT	AUTO (Up)
LIGHT OFF	LIGHT (Up)
FAN OFF	FAN (Up)
Front and Rear MONITOR OFF	On (Up)
INSP OFF	OFF (Down)
IND SERVICE GROUP	GROUP (Down)

2-20. OPERATING SEQUENCE. In the lobby, lighting of the directional arrows in the landing position indicator over an entrance informs passengers that this is the next car to leave. As passengers enter the car, they touch buttons on the car operating panel for floors desired; the buttons so selected light up. At the end of a dispatching interval, or as soon as the car becomes filled, the doors close and the car starts its trip.

2-21. The elevator accelerates, lights a directional hall lantern in advance of its landing stop, slows down and starts to open car and hoistway doors while leveling into the landing. The corresponding registration light on the car operating panel goes out. All these operations are performed automatically under control of the group supervisory control system.

2-22. At a landing, car and hoistway doors remain open a predetermined length of time to allow the passengers to enter or leave the car. Automatically selected door open timing keeps doors open less for car button stops than for hall button stops. At the lower dispatching terminal, door open time is extended even further.

2-23. When either a Door Open button (FDO or RDO) is pressed, the light ray is obstructed, or pressure is exerted by passenger or baggage on the safety shoe on the front edge of the car door, the door is held open, or if it has started to close, it is reversed and reopened. If a passenger delays door closing beyond approximately 2 minutes (the interval is adjustable from 1 to 2 minutes) a buzzer sounds in the car, and the doors proceed to close at a greatly reduced speed and gently but firmly "nudge" the passenger out of the entrance. However, pressure on the Door Open button still acts to stop and reverse the doors.

2-24. By use of the car intercommunication system, operating personnel can inquire the reason for the delay. Using the intercommunication system, he can also inform personnel in the other car to take helpful action.

2-25. Passengers call the elevator by touching an Up or Down touchbutton at their landing. Touch of the button registers the call, lights the button, and causes the supervisory control system to stop the first available car going in the called direction. Passenger is informed of the approach of the elevator by the lighting of the hall lantern. If a car is substantially filled (as determined by the operation of the load weighing switches beneath the platform), it runs "express", bypassing hall calls (but not car calls) until its load is sufficiently reduced to make room for more passengers. Once the car has stopped at the called floor, both the hall lantern and the touchbutton go out.

2-26. The car continues to serve remaining car and landing calls, with car stops being made in the order in which the landings are reached, irrespective of the order in which the buttons are pressed. However, the button must have been pressed sufficiently in advance of car arrival to permit the car to slow down and stop. When two cars are in service, only the first car to approach a landing in the proper direction stops to answer a call from that landing. If the first car is traveling nonstop due to the action of the load weighing device, the landing call is automatically transferred to the next car approaching the landing in the desired direction.

2-27. INDEPENDENT SERVICE. When the IND SERVICE - GROUP switch is placed in the IND SERVICE (Up) position, the car answers only calls registered on its car dispatch buttons, while bypassing all calls registered on the landing button fixtures. The elevator is also disconnected from the automatic dispatching system, its hall lanterns do not operate, and it does not operate highest call reversal. When on independent service, a car may be removed from service and parked with its doors closed by placing the STOP-START GENERATOR switch on the lobby control panel in the STOP position. Car lights, car position indicators, and fans are turned off by this action.

2-28. ATTENDANT OPERATION

2-29. SWITCH SETTINGS. To change over to attendant operation, the AUTO-ATT switch in the service cabinet of the main car operating panel is set to ATT. All other controls can be left in the position specified in paragraph 2-19. It is possible to operate one elevator in the group with an attendant while the other operates unattended.

2-30. OPERATING PROCEDURE. The car attendant has full control over door closing and car starting. He may also bypass hall calls. Dispatching, however, remains under control of the group supervisory control system. Operating procedure is as follows:

a. The loading light on the car operating panel (letter L with white jewel) is illuminated when the car is at a dispatching terminal and is designated to be the next car to leave that terminal. It tells the attendant to receive passengers. (Load weighing devices are not operative at this time; attendant must see to it that the car is not overloaded.) Loading light goes out when dispatching light comes on.

b. Car attendant touches the car dispatch buttons on the car operating panel corresponding to those landings to which the passengers desire to go. Selected buttons illuminate.

c. The dispatching light (green arrow for up, red arrow for down) is illuminated and a soft-tone gong sounds to inform the attendant that it is time to leave the dispatching terminal. Dispatching light remains illuminated until the car reaches the opposite terminal or until the group supervisory control system reverses the direction of car travel.

d. The attendant initiates the closing of the car and hoistway doors by pressing the FDC (Front Doors Close) or RDC (Rear Doors Close) button as appropriate. After the door interlock circuits have been completed, the car starts automatically.

e. Elevator proceeds to answer all registered car calls. Acceleration, deceleration and stopping of car as well as opening of car doors are under control of supervisory control system.

f. Elevator answers all landing calls to which it is assigned by supervisory control system. However, if attendant presses NON-STOP button elevator bypasses all landing calls.

g. If NON-STOP button is depressed in an approaching car, the landing call is automatically transferred to the next car approaching the landing in the desired direction.

2-31. INSPECTION OPERATION

2-32. INITIATING INSPECTION

2-33. The inspection initiating switch IIS, located in the service cabinet of the main car operating panel, will disconnect the call registration relays and condition the elevator control circuits for access switch operation and for top-of-car inspection.

2-34. ACCESS SWITCH OPERATION

2-35. Access switches TAK and BAK are provided at the upper and lower terminal landings, respectively. During inspection, these switches are used to operate the elevator from the landing with the hoistway door open.

2-36. To gain access to the top of the car, the elevator is sent to the upper terminal, the inspection initiating switch IIS is placed in the INSP position, and car and hoistway doors are opened. The inspector inserts his key into access switch TAK (located adjacent to the hoistway door at the top landing) and turns it to the position marked "D". This action bypasses the hoistway door interlock and moves the elevator downward, permitting the inspector access to the roof of the elevator. When released, the access switch springs back to a neutral position to stop the elevator.

2-37. After top of car inspection is completed, access switch TAK is operated to move the elevator up to its normal operating position. The key can be removed when the switch is in its neutral (off) position. The inspection initiating switch IIS is restored to the OFF position, returning the elevator to service.

2-38. To inspect the bottom of the car, or to gain access to the elevator pit, the elevator is sent to the lower terminal landing, and the BAK access key switch used to move the elevator up.

2-39. TOP OF CAR INSPECTION

2-40. Once access to the top of the elevator has been gained, the top of car inspection switch (TCIS) is operated to the INSP position to transfer control of the elevator from the access key switch to the top of car inspection buttons. TCIS is located in the control box at the top of the car.

2-41. After closing the hoistway door, the elevator can be moved downward by maintaining continuous pressure on both the control inspection button CIB and the adjacent down ("D") inspection button TDIB. Releasing pressure from either button will stop the elevator and set the brake.

2-42. In a similar manner, the elevator can be moved upward by maintaining continuous pressure on the control inspection button CIB and the up ("U") inspection button TUIB.

2-43. EMERGENCY OPERATION

2-44. PROTECTIVE SWITCHES

2-45. MANUALLY OPERATED STOP SWITCHES. The following manually operated switches will stop and/or prevent elevator motion until the switch used is returned to its normal position.

Switch Designation	Name	Location
1ES1	Emergency STOP Button	Main Car Operating Panel
2ES1	Emergency STOP Button	Aux. Car Operating Panel
TES	Emergency STOP Button	Top of Car Control Box
PES	Emergency STOP Button	Elevator Pit
COS	Cutoff Switch	Front Selector
RCOS	Cutoff Switch	Rear Selector
1SK, 2SK	Service Knife Switches	Machine Room

2-46. MECHANICALLY ACTUATED STOP SWITCHES. The following mechanically actuated switches will stop and/or prevent elevator motion until the switch is reset.

Switch Designation	Name	Location and Function
1LS1	Down Final Limit Switch	Near bottom of hoistway. Operated by cam on car-frame if car passes lower limit of travel.
2LS1	Up Final Limit Switch	Near top of hoistway. Operated by cam on car-frame if car passes upper limit of travel.
1OS	Main Line Governor Switch	At governor. Trips when car speed reaches 795 FPM

Switch Designation		
SOS	Safety-Operated Switch	At car safety. Trips when safety operates
CSS	Compensating Sheave Switch	On compensating sheave guide rail. Operated by tripper on tension frame if compensating sheave exceeds limit of travel.
SS	Terminal Stopping Switch	Atop car. Operated by cam in hoistway at either terminal.
BTS	Broken Tape Switch	On car as part of selector tape hitch. Failure of tape trips switch.
DS	Hoistway Door Interlocks	On header over each hoistway door. Switch opens when hoistway door is opened.
1P, 2P, 3P	Overload Relays	On motor generator set. 1P, 2P operate if starting sequence fails. 3P operates if generator stalls.

2-47. To reset the final limit switch and resume normal operation, elevator must be returned to its normal operating zone by intermittent manual operation of the direction switches "U" and "D" and the field and brake switch "H" on main controller. Manual operation of the controller switches will release the brake and move the elevator in the direction selected.

CAUTION

"Inch" elevator back to normal operating zone by intermittent manual operation. Continuous pressure on these switches will allow elevator to run away.

2-48. Main line switch 1OS and safety-operated switch SOS must be reset by hand. To release the car safety, press intermittently on "U" and "H" controller switches to inch elevator upwards.

2-49. CSS and BTS are manually reset. Hoistway door interlocks DS are closed by closing hoistway door completely. Overload relays are manually reset after cause of overload has been removed.

2-50. EMERGENCY BELL

2-51. Pressing the EMERG CALL button on the main and auxiliary car operating panels will sound an alarm bell to summon assistance. Releasing the emergency call button will silence the alarm bell.

2-52. EMERGENCY OPERATION WITH POWER SUPPLY FAILURE

2-53. SELECTIVE STOPPING ON HALL BUTTON POWER SUPPLY FAILURE. When the hall button power supply fails, each elevator stops at a preselected sequence of landings. Stops are wired into the selector so that at least one car stops at every front landing in each direction. Hall stops are not under control of the attendant at this time.

2-54. EMERGENCY POWER SUPPLY. Failure of the normal power supply will cause the NORMAL POWER SUPPLY lamp on control and communication panel in the LCC building to go out and the OUT OF SERVICE lamp for that elevator to light. An emergency power keyswitch (one per elevator, located just beneath the indicator lamps) allows the starter to operate the elevator on emergency power supply; the EMERGENCY POWER SUPPLY lamp for that elevator lights. Two keys are provided for elevators 1 through 16, so that only two high-bay elevators can be operated on the emergency power supply.

2-55. EMERGENCY SERVICE

2-56. This procedure is employed to make a car quickly available for emergency use.

2-57. The EMERGENCY SERVICE keyswitch on the control and communication panel is momentarily operated. The Dispatch Failure warning lamp on the panel will light, indicating that the car is responding to the emergency service call, unless the car is on inspection operation or is shut down by EMERG STOP switch operation.

2-58. The buzzer in the car operating panel will sound, informing passengers that the car has been commandeered for emergency service. All car and hall calls will be cancelled, and call buttons rendered ineffective until the car reaches the main landing.

2-59. A down-traveling car will continue non-stop to the main landing. An up-traveling car will stop at the next landing, without opening doors, reverse direction, and travel non-stop to the main landing. If the car has initiated a stop, it will complete the stop without opening doors, and then travel non-stop to the main landing. Finally, a car waiting to be dispatched at the upper terminal will close its doors at slow speed and proceed non-stop to the main landing.

2-60. When the car arrives at the main landing and opens its doors, the INDEPENDENT SERVICE keyswitch in the car is operated. The car will now respond to calls on its own car buttons, but not to hall calls. Doors are closed by constant pressure on a DOOR CLOSE button. If the incorrect car button was touched, the keyswitch is turned to the left and then to the right to cancel the call, and then the correct car button is touched.

SECTION III

CIRCUIT DESCRIPTION

3-1. GENERAL

3-2. Numbers in parentheses indicate the location of the preceding symbol on the schematic (straight) diagram, Figure 8-54. Sheets 7 and 8 of Figure 8-54 contain a tabulation of the components appearing on the schematic. Wiring of car, hoistway, and machine room components is shown in Figure 8-55.

3-3. ELECTRONIC TOUCHBUTTON OPERATION

3-4. TOUCHBUTTON CONSTRUCTION. Electronic touchbuttons (9, 20) are used in all car and landing button fixtures. The button itself is mounted in the faceplate surrounded by a translucent plastic shield; an electronic tube is located behind the button.

3-5. The front of the button is coated with an insulating material of high dielectric constant. The back of the button is coated with an electrically conductive material and makes contact through a spring with an electrically conductive coating on the top of the electronic tube. Thus the button forms one plate and the dielectric of capacitor.

3-6. The electronic tube is a "cold cathode" gas-filled tube containing an anode, cathode, and grid. For the single riser installation (as in the landing button fixtures), the grid is connected directly to the cathode.

3-7. A 135-volt d-c potential (B+) is connected between anode and cathode; this potential is insufficient to ionize the gas so that no current flows through the tube. A 150-volt a-c potential (BO2) is also applied to the cathode of the tube; this a-c potential has no effect on the circuit until the button is grounded.

3-8. PLACING THE CALL. When a prospective passenger touches the button, his finger serves as the second plate of a capacitor while his body impedance completes the a-c path from the conductive coating on the tube to ground. This places a-c between anode and cathode (the conducting coating is close to the anode) and the 210-volt a-c (peak) potential causes

the tube to ionize. The orange glow from the cathode of the ionized tube illuminates the translucent arrow on the button, informing the passenger that his call is registered. The 135-volt d-c potential from plate to cathode keeps the tube ionized after the passenger has removed his finger.

3-9. When a car button is touched on the first car operating panel the corresponding button must light up on the second car operating panel. For this purpose, the grid of each touchbutton tube is connected to a -30 volt bias. A total difference of 92 volts will exist between grid and cathode when firing of the first tube raises the cathode to about 62 volts. This is sufficient to cause breakdown of cathode to grid of the second tube; as soon as ionization takes place between cathode and grid, ionization also occurs between anode and cathode.

3-10. Neon indicator lamps on the dispatcher and electronic controller panel light up to indicate registered hall calls. When the touchbutton conducts, its cathode potential rises sufficiently to inoize the neon indicator.

3-11. CANCELLING THE CALL. The call is cancelled when the elevator arrives at the floor. When stop brush CAB (9) touches stop contact CAC (9) on the floor bar of the called floor, the positive d-c voltage at the touchbutton cathode is applied to thyratron XCB (9), ionizing the thyratron and energizing relay CBS (9). The a-c potential at the XCB cathode is applied through CBS 3-4 to the cathode of the touchbutton tube. During the positive alternation of this a-c voltage, the touchbutton cathode rises to a high enough voltage so that the cathode-anode potential is insufficient to maintain ionization.

3-12. An additional problem exists in cancelling a car call. With the touchbutton grid connected to a -30-volt bias and the cathode raised to a positive potential, the grid-cathode potential difference is sufficient to maintain ionization. Therefore, a capacitor is placed between grid and cathode. As it starts to charge to the grid-cathode potential difference, the capacitor shorts grid to cathode just long enough to permit de-ionization of the tube.

3-13. DISPATCHING

3-14. TRAFFIC PROGRAM SELECTION

3-15. With the Program Selector keyswitch TPS (23) on the control and communication panel set at AUTOMATIC (position 1), the supervisory system will automatically select the dispatching pattern to meet the demand, switching in a different dispatching pattern as often as required by the changing traffic conditions. Manual program selection can be accomplished

by turning switch TPS from AUTOMATIC to one of its other positions. The four dispatching patterns, and the relays associated with their selection, are tabulated below:

Pattern	Relays Energized	
	Automatic Selection	Manual Selection
Intermittent	Relay HJ (6, 20) energized, indicating existence of hall call.	Relay LT (23) energized.
Up-Down (Balanced)	Relay HJ energized. Continuous call relay CC (21) energized, indicating existence of hall call(s) for at least 90 seconds.	Relay MUD (23) energized.
Up Peak	Relay HJ energized. Up peak relay XUP (24) energized by automatic peak selection circuit, energizing relays UP, UPX (23). Relay CC may or may not be energized.	Relays UP, UPX (23) energized.
Down Peak	Relay HJ energized. Down peak relay XDP (24) energized by automatic peak selection circuit, energizing relays DPS, DPSX (23). Relay CC may be energized.	Relays DPS, DPSX (23) energized.

3-16. INTERMITTENT PROGRAM

3-17. ESTABLISHMENT OF INTERMITTENT PROGRAM. The intermittent program is set into operation in the presence of a hall call and the absence of a peak and continuous call condition. INTERMITTENT lamp IL (25) on the control and communication panel in the LCC building lights whenever neither the UDX (auxiliary up-down relay energized in the continuous call condition) nor the UPX and DPSX (up and down peak relays) are energized.

3-18. Dispatch of a car from either terminal occurs when the automatic start relay ASR (6) is released, dropping relays XCS (5) and XCSX (2), in turn dropping relays 1DO (4) and 2DO (4) to close the doors. Relay ASR (6) is released at the lobby terminal when relay UDR (6) is energized. Relay UDR (6) is energized when:

a. Car is selected for dispatch (SC contacts 5-6 close).

b. A hall call exists (HJ contacts 3-4 close)

c. The group up dispatch signal has been given (interval timer AUT has timed out, relay UT released, releasing GUD and closing GUD contacts 1-2).

3-19. MOTOR-GENERATOR PREFERENCE. If the selected car does not have its motor-generator set running, selection will be transferred to the other car if available at lobby with its motor-generator set running. Motor-generator preference relay MGP (21) is energized if MLU contacts 3-4 are closed (car at lobby, direction circuits set for up trip) and ETS contacts 1-2 are closed (demand for service exists) for either car. With relay MGP energized, the SC (6) relay for that elevator will be energized if its K contacts 3-4 are closed (motor-generator set running). If the MG set is shut down, the SC and SCX relays will drop, and break contacts 1-2 will energize the SC and SCX relays of the other elevator.

3-20. INTERVAL TIMER. Interval timer AUT (24) is set to maintain a fixed 30-second dispatching interval during intermittent operation. If one or more calls remain unanswered for 30 seconds while the first car is answering calls, the motor-generator set of the second car will be started and the second car will respond to the call. If both cars are in use, interval timer AUT will begin timing either when a call is registered in the first car or when the second car has reversed, whichever occurs first.

3-21. The interval timer consists of relay UT (24) connected between capacitor AUT and the output of a cathode follower. The circuit is reset by charging the AUT capacitor to the 120-volt line; relay UT is then energized by the voltage difference between the charged AUT capacitor and the cathode follower output. The timed interval is started by opening the 120-volt line; the AUT capacitor then starts to discharge through rheostat P3. The potential difference across relay UT decreases until the relay drops out. The drop-out point is determined by the setting of potentionmeter P1 (which determines the speed of capacitor discharge). The controls are set to provide a 30-second dropout time in the intermittent program.

3-22. Reset occurs when the car is dispatched, i.e., when UDR contacts 11-12 and SCX contacts 11-12 close, connecting 120 volts to the AUT capacitor and energizing the UT relay. The timing interval starts either when a call has been registered in the dispatched car (HG contacts 7-8 open) or the other car has reversed (opening of UDR contacts 5-6).

3-23. HIGHEST CALL REVERSAL. Up traveling cars will reverse at their highest call, return to the main landing (collecting any down calls enroute), and park until again selected and dispatched.

3-24. Up and down hall calls registered above the car are recognized by thyratron XHJ (20) which ionizes and pulls in one winding of relay HJ. Car calls above the car are recognized by thyratron XHG (9) which ionizes and pulls in relay HG; contacts 5-6 of HG energize the second HJ winding. When the highest hall and car calls are answered, thyratrons XHJ and XHG will de-ionize. Relay HJ is released when both thyratrons are de-ionized.

3-25. Highest call return relay HR (6) is energized through HJ break contacts 7-8. HR contacts 3-4 energize the DG relay reset (DOWN) winding (5), HR contacts 7-8 release relays HRX and HRY (6). The selector is transferred from UP to DOWN hall buttons and hall lanterns (20) by the closing of HRY contacts 1-2 and the opening of HRY contacts 3-4.

3-26. FULL CAR EXPRESS. Full cars run express in <u>any</u> dispatching program. When the express car is fully loaded, load weighing switch 4LW (6) opens to release non-stop relays NS and NSX (6). When released, these relays cause the elevator to bypass hall calls, NS contacts 1-2 disconnecting the hall lanterns (25) and NSX contacts 3-4 disconnecting the UHB and DHB (20) stopping brushes so that the selector will not pick up any hall-registered stops.

3-27. If the car becomes fully loaded at the lobby, NS contacts 5-6 energize relay UDR (6) to dispatch the car immediately.

3-28. PARKING AND SHUTDOWN. When a car is parked at the lobby before it is shut down, its doors will be open and, if it is the selected car, its hall lantern will be lit. When all cars are parked at the lobby, and no calls have been registered for 2 minutes, the doors will close and the motor-generator set will be turned off.

3-29. Relay GCR (21) releases when all cars stop running. MGT timer (21) closes after 2 minutes. MGT contacts 1-4 release relay MGTX (21), releasing relays RO (3), 1DO and 2DO (4) to close the car doors. Relay ETS (5) times out, releasing relay K (7) and shutting down the motor-generator set.

3-30. UP-DOWN PROGRAM

3-31. ESTABLISHMENT OF UP-DOWN PROGRAM. The Up-Down (balanced) program is set into operation if hall call(s) have been in continuous registration for 90 seconds and in the absence of a peak condition. UP-DOWN lamp UDL (25) on the LCC building Control and Communication Panel lights whenever UDX (auxiliary up-down relay, energized under continuous call conditions) is energized.

3-32. The cars will be dispatched at regular (approximately 30-second) intervals from both the lobby and top floor terminals, one car leaving from the top floor at the same time as the other leaves from the lobby. Late cars will be operated highest call reversal in the upper third of the building.

3-33. CONTINUOUS CALL TIMER. Prior to the registration of hall calls, continuous call timer CC (21), a cold-cathode thyratron, is shorted out by break contacts 1-2 of CCX and 5-6 of HCS. Capacitor CC is fully charged to 120 volts. Thr grid potential is zero.

3-34. Existence of a hall call is recognized by the energizing of relay HCS (21). When HCS contacts 7-8 open, capacitor CC begins to discharge through resistor section 6-10. As the capacitor discharges, the voltage across it decreases, while the voltage from grid to ground increases, the sum of the two equaling 120 volts. After approximately 90 seconds, the grid voltage is high enough to fire the thyratron and energize relay CC.

3-35. CC contacts 3-4 energize relays UDX and CCX (21). UDX contacts 1-2 open, turning off the INTERMITTENT light (25) on the control and communication panel in the LCC building. UDX contacts 3-4 close, turning on the UP-DOWN light.

3-36. AUTOMATIC INTERVAL ADJUSTMENT. CCX contacts 3-4 close, placing a false top floor call into the selector (20). This action forces the car to the upper dispatching terminal, and prevents the highest call return operation. CCX contacts 7-8 open, so that interval timer AUT (24) is not reset when the selected car has answered the last hall call. Timer AUT (24) is recycled when the selected car (SCX contacts 11-12 closed) begins its up travel (UDR contacts 11-12 closed). The AUT capacitor charges to 120 volts and relay UT is energized.

3-37. CCX contacts 5-6 open, removing potentiometer P1 (24) from the circuit. Interval timing was fixed at 30 seconds in the intermittent program; in the up-down program, it is adjusted automatically to balance the cars - i.e., to cause cars to be dispatched simultaneously from upper and lower terminals.

3-38. Relay UT (24) begins to time out after the elevator has left the main landing (SC contacts 11-12 open). The length of time required for UT to time out (and hence the spacing between dispatching intervals) is determined by the cathode follower output voltage (point 13). This voltage is determined by the charge on the capacitor between points 3-12.

3-39. If a car arrives early, that is, when MGP contacts 11-12 are closed (car at main landing with its motor-generator set running) and GUD contacts 11-12 are closed (up dispatch signal not given), the cathode follower grid voltage is gradually raised as the capacitor between points 3-12 charges. The cathode follower output voltage increases. The voltage drop across relay UT is reduced, reducing the dropout time. When relay UT releases, relay GUD (23) releases to give the up dispatch signal. In this way, when cars arrive early, the dispatching interval is shortened. The capacitor (3-12) holds its charge so that its voltage represents the average time for a round trip. The earlier the arrival of the car, the longer GUD (23) and MGP (21) will be energized coincidentally, the longer time the capacitor will have to charge, the higher the voltage to which it will charge, and the shorter the dropout time of relay UT.

3-40. The early car is held at the terminal until the dispatching signal (release of GUD) is given.

3-41. If a car arrives late, that is, when relay UT has timed out (dropping GUD) before MGP has energized, GUD contacts 7-8 connect the grid of the AUT thyratron (24) to a lower voltage. The capacitor discharges to this lower voltage and, on the succeeding time cycle, relay UT will require a longer time to release (because the cathode follower output voltage is reduced).

3-42. As soon as the late car arrives, it is dispatched upward from the lobby terminal.

3-43. LATE CAR RETURN. If the scheduled (timed) interval at the upper terminal has elapsed, and no car is available to receive the signal, the first available up traveling car (within the upper third of the building) will be automatically reversed when it has no calls requiring further upward travel. At the point of reversal, it will receive and respond to the upper terminal down dispatching signal. By this means, time lost by a delayed car may be made up without bypassing registered calls.

3-44. Contacts 5-6 of GDD (20) open when the down dispatching signal is given, removing the false hall call from the top-floor floor bar. The car must answer calls to at least the upper third of the building (through floor 24) because of the LHR (65-volt) signal applied to terminal E6. Beyond the 24th floor, the car will answer the highest call and then reverse, as explained in paragraph 3-23.

3-45. PARKING. The up-down program remains in effect until 2 minutes after the last call is answered, after which the cars will park at the lobby.

3-46. When all hall calls have been answered, HCS contacts 11-12 open and the MGT capacitor (21) begins discharging. Approximately 2 minutes later, assuming no other hall calls registered, the MGT capacitor has discharged sufficiently to allow the MGT thyratron (21) to fire and energize relays MGT and MGTX (21).

3-47. MGT contacts 3-4 short out the CC timer (21), de-ionizing the thyratron and releasing relays CC and CCX. HCS contacts 7-8 and MGTX contacts 11-12 allow capacitor CC to recharge quickly in preparation for the next continuous call operation.

3-48. When CC releases, its contacts 1-4 and GCR contacts 5-6 (closed if at least one car is running) short out the MGT timer (21). When MGT contacts 3-4 open, the CC timer (21) is shorted only by CCX contacts 1-2 and HCS contacts 5-6 and the operation is ready to be performed again. The system has now reverted to the Intermittent program.

3-49. Release of relay MGTX drops relays RO (3), 1DO and 2DO (4) to close the car doors. Relay ETS (5) times out, releasing relay K (7) and shutting down the motor-generator set.

3-50. UP PEAK PROGRAM

3-51. ESTABLISHMENT OF UP-PEAK PROGRAM. The up-peak program is set into operation whenever relay XUP (24) is energized by the automatic peak selector APS (24) circuit. This circuit will energize XUP whenever both cars have been traveling up for a predetermined period. Relay XUP, in turn, will energize relay UPX (23). UP PEAK lamp UPL (25) on the control and communication panel in the LCC building is turned on by relay UPX.

3-52. The dispatching operation will be the same as that described for intermittent operation except that, once started, absence or presence of hall calls will not cause the motor-generator sets to be shut down until the up-peak does not exist. However, if a continuous call condition exists, the cars will be dispatched from the lower terminal at 30-second intervals commencing from the dispatch of the previous car.

3-53. AUTOMATIC PEAK SELECTOR. Selection of Up Peak and Down Peak programs is accomplished by a cathode follower summation circuit, APS (24). In this circuit, each Up traveling car is connected to -120 volts (terminal C213) and each Down traveling car is connected to +120 volts (terminal C181), both through directional relay contacts. At any instant, then, the sum of the grid voltages represents how well balanced the traffic is in both directions. The average unbalance over some time is represented by the charge on capacitor APS.

3-54. With the traffic equal in both directions and the cars balanced (i.e., one car leaves from lobby at the same time the other leaves from the top floor), the output of the resistive network (terminals 9-16) is 0 volts. When the traffic is heavier in the Up direction, a negative voltage will be impressed across terminals 9-16; if traffic is heavier in the Down Direction, a positive voltage will be impressed across terminals 9-16. The 10-mfd APS capacitor charges slowly to the voltage across terminals 9-16. The polarity of the voltage across the APS capacitor indicates the direction of the unbalance; the amplitude of the voltage indicates both the extent of the unbalance and the time duration during which this unbalance has existed.

3-55. If Up-dominant traffic exists long enough for the APS capacitor to charge to 42 volts, relay XUP (24) will be energized to transfer the dispatcher to the Up Peak program. When XUP energizes, its contacts 1 and 2 energize relays UP and UPX (23). Contacts 5-6 of UP release relay UDX (21), disconnecting the up-down program. UPX contacts 1-2 open the line to the INTERMITTENT lamp IL (25) while contacts 5-6 light the UP PEAK lamp UPL (25) on the control and communication panel in the LCC building.

3-56. HIGHEST CALL RETURN. (See Area 6.) To make it possible for both cars to operate highest call reversal in the up-peak program, UP (A) contacts 1-2 short out SCT(B) contacts 1-2 while UP(B) contacts 3-4 short out SCT(A) contacts 1-2.

3-57. TIMED DISPATCH FROM LOWER TERMINAL. If the up-peak condition exists, but not the continuous call condition, a car is dispatched from the lobby 30 seconds after the last up traveling car has reversed at its highest call or a car call has been registered in the lobby car. If the continuous call condition also exists (i.e., if hall calls are registered continuously for a 90-second interval), a car is dispatched 30 seconds after the dispatch of the other car.

3-58. Timing relay UT (24) is set for fixed, 30-second dropout when UP contacts 11-12 connect the interval timer grid to potentiometer P1. The timer is reset (AUT capacitor charges to 120-volt line voltage) when the car is dispatched (contacts 11-12 of UDR and SCX close). If continuous call does not exist, the 30-second timing interval starts either when a call has been registered in the dispatched car (HG contacts 7-8 open) or the other car has reversed (UDR contacts 5-6 open). If continuous call does exist, CCX contacts 7-8 will open; the timing interval will then start as soon as the lobby car is dispatched (SCX contacts 11-12 open).

3-59. DOWN PEAK PROGRAM.

3-60. ESTABLISHMENT OF DOWN PEAK PROGRAM. The down-peak program is set into operation whenever relay XDP (24) is energized by the

automatic peak selector APS (24) circuit. APS will energize XDP whenever both cars have been traveling down for a predetermined period. Relay XDP, in turn, will energize relays DPS and DPSX (23). DOWN PEAK lamp DPL (25) on the control and communication panel in the LCC building is turned on by relay DPSX.

3-61. When the cars are on the Intermittent program before the change to down-peak occurs, the cars will be immediately dispatched from the lower terminal (upon expiration of door open time) and operate highest call return whenever calls are registered. When continuous call exists with the down-peak condition, the car will operate whether calls are registered or not with immediate dispatch from the lower terminal, timed dispatching from the top terminal, and late car reversal if necessary.

3-62. AUTOMATIC PEAK SELECTOR. The automatic peak selector circuit (see paragraph 3-53) determines whether the down-peak exists. Specifically, if Down-dominant traffic exists long enough for the APS capacitor (24) to charge to +42 volts, relay XDP will be energized to transfer the dispatcher to the Down Peak program. When XDP energizes, its contacts 1-2 energize relays DPS and DPSX (23). Contacts 7-8 of DPS release relay UDX (21), disconnecting the up-down program. DPSX contacts 1-2 open the line to INTERMITTENT lamp IL (25) while contacts 3-4 light the DOWN PEAK lamp DPL on the control and communication panel.

3-63. INSTANT DISPATCH FROM LOWER TERMINAL. Instant dispatch from the lower terminal is established when relay DPS contacts 1-2 disconnect interval timer AUT (24). Timing relay UT (24) and group up dispatch relay GUD (23) thus remain released in the down-peak program. With GUD break contacts 1-2 closed (6), the selected car (SC contacts 5-6 closed) will be dispatched (UDR energized) as soon as the direction switch has been set (DGV contacts 11-12 closed), the lobby door-open time has expired (NT contacts 1-2 closed), and a hall call is registered (HJ contacts 3-4 closed). Cars operate highest call return.

3-64. If continuous call exists, CCX contacts 3-4 place a false hall call (65-volt LHR signal) on the top-floor bar (20). This signal keeps relay HJ (20) energized, permitting instant dispatch from the lower terminal without a hall call. The LHR signal also institutes timed dispatch from the upper terminal with provision for late car reversal.

3-65. TIMED DISPATCH FROM THE UPPER TERMINAL. If continuous call exists, timed dispatching from the upper terminal is controlled by the dropout time of relay DTR (23). Each time a car leaves the upper terminal, relay DTR is energized through UDR contacts 7-8 (closed when UDR releases as car finishes its upward travel) and SCT contacts 11-12 (closed

when this car has been selected at the top floor). DTR contacts 1-2 energize relay GDD (23). A false top floor hall call, through GDD contacts 5-6 and CCX contacts 3-4 (see area 20) forces the second car to the top floor.

3-66. Once the first car has left the top floor, UDR (6) drops and, after a short delay, SCT (6) releases. SCT contacts 11-12 open, allowing DTR (23) to begin to time out. After approximately 15 seconds, DTR (23) releases and drops relay GDD (23). Release of relay GDD dispatches the second car by removing the false top floor hall call. Relay HJ (20) releases, its contacts 1-2 energize relay HR (6). Relay HR contacts 3-4 reset directional relay DG (5) to the down direction.

3-67. Only one car at a time can be reversed at the top. SCT (A) contacts 1-2 in the HR (B) operate path (6) and SCT (B) contacts 1-2 in the HR (A) operate path (6) assure that only one car be selected at the top.

3-68. LATE CAR REVERSAL. A car delayed enroute will not be able to reach the top floor when GDD releases. The LHR signal (20) fed through terminal E6 will force the car to the 25th floor. With GDD released, the car will be reversed as soon as it has answered its last call beyond the 25th floor.

3-69. ZONE RETURN. With heavy down traffic, the cars will fill at the upper floors and then run express to the lobby. To be sure that passengers on lower floors are not thereby subjected to excessive waiting times, the building is divided into two zones with one car serving the upper floors primarily and the other serving the lower floors exclusively. The low zone consists of front landings 1 through 24 and rear landings A through G. The high zone consists of front landings 25 through 37 and rear landings H, J and K.

3-70. Zone return goes into operation [i.e., relay ZR (22) energizes] when both of the following conditions exist:

a. The car is fully loaded (load weighing switch 4LW closed, load non-stop relay LNS energized) on the down-trip (down direction relay DGF energized). If either car is operating express, DGF and LNS will energize relay NUS (23).

b. At least one Down hall call (19) is registered in the low zone (low zone call relay LZC energized).

3-71. Zone return relay ZR (22) energizes through NUS and LZC. Relay ZR contacts 11-12 energize auxiliary zone return relays ZRA, ZRB and ZRU through ZRZ (22). Relay ZRX contacts hold in NUS (23). Zone return remains in operation until all low zone Down calls have been answered.

3-72. Timed dispatching from the upper terminal is disconnected when ZRZ contacts 7-8 open (Area 20), removing the false top floor hall call. Opening of ZRZ contacts 7-8 also removes the false 25th floor hall call, thereby disconnecting late car reversal.

3-73. Car "A" is selected as the high-zone car when ZR(A) contacts 3-4 (9) place a false car call on the 24th front landing, while contacts 5-6 register a false car call on the 8th rear landing. This signal forces car "A" to travel up to a high zone. As the high zone car, "A" will

a. Collect all Up calls in both zones until full.
b. Operate highest call reversal in high zone.
c. Collect down calls until fully loaded.
d. Run express on down trip when fully loaded. (Load weighing switch 4LW releases non-stop relay NS.)

3-74. Low-zone car "B" will not collect lobby traffic on the Up trip because ZR break contacts 1-2 (25) will prevent its main floor hall lantern from lighting and its loading gong from sounding. When dispatched from the lobby, the empty low zone car will:

a. Collect all low-zone Down traffic. The car will not collect high-zone hall calls because ZR break contacts 7-8 (20) will reverse the car at the 24th floor.

b. Operate highest call reversal in its zone on Down calls only (break contacts on auxiliary zone return relays disconnect Up touchbuttons from floor bar HH contacts).

c. Collect low-zone Up traffic until the reversal point.

d. Answer car calls for Up service, even to high-zone.

3-75. MANUAL PROGRAM SELECTION

3-76. Programs are manually selected by turning switch TPS (23) to one of its other positions. With switch TPS turned off AUTOMATIC, relay MSS (23) releases, preventing the automatic peak selection circuit from energizing up and down peak relays UP and DPS (23).

3-77. When the UP PEAK (or DOWN PEAK) program is manually selected, relays UP and UPX (or DPX and DPSX) are energized through TPS (23). Manually selected peak operation is the same as the automatic operation. The program is automatically modified by the operation of the continuous call timer.

3-78. When the UP DOWN program is manually selected, manual up-down relay MUD (23) is energized. MUD contacts 5-6 energize relays UDX (21) and CCX (21) inaugurating the up-down program with "permanent" continuous call. MUD contacts 3-4 short out MGT contacts 1-4, holding in relay MGTX (21). During the manually selected UP DOWN program, the motor-generator set will keep running and the car doors will remain open at the lobby, even in the absence of a service demand for over 2 minutes.

3-79. When the INTERMITTENT program is manually selected, light traffic relay LT (23) is energized. LT contacts 5-6 open the operate path to relays UDX and CCX (21). Disconnecting CCX disconnects the continuous call program. LT contacts 1-2 open, disconnecting MGTX (21). Cars will park at the lobby with doors closed as soon as the door-open time has expired.

3-80. CAR OPERATING SEQUENCE

3-81. Assume that the elevator is operating under control of the group supervisory system, without an attendant. Assume also that the first floor is the main (home) landing floor. Assume that COS and all the emergency stop and overload switches described in paragraph 2-44 are closed.

3-82. PARKED ELEVATOR

3-83. The car is parked at the main floor with the door closed and the motor-generator set shut down.

3-84. Service knife switches 1SK (1) and 2SK (19) are closed. These are the main power switches located on the main controller in the machine room and are closed unless repairs are to be performed on the elevator. With the service knife switches closed, a-c power is applied to transformers TRF (1), CTRP (9), CTR (9), HBTR (19), TLR and HTR (19), to reactor REA (1) and to rectifiers RF (2), RRF (1), CRF (9), and HBRF (19). These rectifiers supply d-c power to the terminals to which they are connected.

3-85. Door motor field DMF (2) receives energizing power. Relays 1INS, 2INS and 3INS (2) are energized; these relays are de-energized only when the elevator is to be shut down or when inspection operation is desired. Relays IS and ISX (2) are energized; these relays are de-energized only when the elevator is to be shut down or when independent service operation is desired. Relays ATT and ATTX (2) are energized; these relays are de-energized only when the elevator is to be shut down or when attendant operation is desired. Relay ML (5) is closed, completing the path to relay DG (5) and providing more door time at the lobby by discharge through NT (3). Relay DG (5) is energized to indicate that the elevator is to travel up. Electronic button reset relay EBR (5) is energized which connects power to the car operating panel touchbuttons.

3-86. With COS energized, (10), relay WLD (22) is energized; this relay remains energized unless a dispatching failure occurs. (The WLD relay is explained further under "Emergency Dispatch".) Relay NS (5) is energized: this relay is energized unless the NON STOP button is pressed on the car operating panel when the car is on attendant operation. Relay AIS (5) is energized; this relay remains energized except when the car is on independent service. Relays WLDX (22), DGV (5) and DGX (5), supplementing the functions of the WLD and DG relays, energize. Relay HRX (6) energizes, conditioning the highest call reversal circuit.

3-87. STARTING MOTOR GENERATOR SET AND OPENING DOOR

3-88. A passenger on the main floor touches the hall button HB (20).

3-89. Relay HS (20) energizes and, in turn, energizes XDO (3), the motor generator start and door open relay. Relay HCR (20) energizes, establishing the highest call return circuit.

3-90. Relay XDO (3) energizes, which performs several functions -- it energizes its auxiliary, XDOX (3) and ETS (5), the excitation time switch used to turn off the motor generator set if no calls are registered after a period of time. ETS, in turn, energizes its auxiliary ETSX (5).

3-91. Automatic start relay ASR (6) energizes through NT and ETSX contacts. XCS (5) energizes, conditioning the door open circuit. MLU(6) energizes, readying the motor-generator preference circuit. Selection relays SC and SCX (6) energize. ETS and MLU contacts energize MGP (21), establishing the motor-generator preference circuit and energizing relay K(7), the running switch. OUT OF SERVICE light OSL (25) on the control and communication panel goes out.

3-92. Relay L (7) energizes, wye connecting the generator drive motor DV (1) to lines L1, L2 and L3. Generator starts. Relay DP (2) energizes, completing path to safety shoe magnet, and readying door open circuit which will start when DOL energizes. Generator armature GA (11) and exciter generator EA (10) come up to speed. Exciter generator EA supplies d-c power to the main controller terminals.

3-93. D-c power from generator armature is applied to elevator drive motor field MF (10). As drive motor builds up speed, minimum current relay 1MC (10) operates, energizing relay XM (7). Relay XM energizes relay M (7), and de-energizes relay L (7) a few seconds later. Driving motor wye connection is disconnected and delta connection substituted. The numeral "1" (1P lamp) is illuminated on the car position indicator (25), the landing position indicator (25), and the position indicator on the control and communication panel (25). Generator pilot light PLT (25) illuminates.

3-94. Load compensating switches LC, RC and TC (12) energize; as passengers enter the car, one or more of these switches will drop out and remove resistance from the generator compensating field. Releveling excitation switches 1RL and 2RL (18) energize, placing a portion of the leveling field resistance in series with the leveling field of the generator. This circuit, in conjunction with the load compensating switches, relevels the elevator as passengers enter or leave the stopped car.

3-95. Relays C, CW and CX (10) energize if all protective circuits (paragraph 2-44) are closed. Auxiliary potential switches CX and CY (10), in conjunction with feedback switch FBS (14), close the feedback circuit around the generator. During the releveling operation, the feedback circuit will cancel out any unwanted voltages that may effect the accuracy of leveling. Speed switch relays 1XE through 4XE and FXE (18) energize, placing the speed control circuit at the position that will provide maximum starting torque.

3-96. Relays DOL, 1DO and 2DO (4) energize, de-energizing the DMA (1) door close circuit and energizing the DMA door open circuit. The door starts to open.

3-97. The door motor drives rheostats and limit switches mounted in control box DOCB on top of the elevator. The motor torque exerted to open the door is determined by limit contacts 01 through 06 and C1 through C6 which adjust the d-c level in the control winding of saturable reactor REA (10). When the door starts to open, limit contacts C1, 01, 02 and C3 close; contacts C2, C4, and 06 open. Relay GH (2) operates through contact C1. Up arrow on landing position indicator and loading light on car operating panel illuminate; soft tone gong sounds, indicating "This car up". Contacts 01 and 02 short out resistances in series with the control winding of saturable reactor REA (10). The increased

current flow through the control winding increases the reactance of the controlled winding (1-2 in parallel with DMA), increasing door motor speed.

3-98. With the door almost fully open, contacts 03 and 04 open, adding resistance to the reactor control winding, decreasing door motor speed. Contact 05 opens, de-energizing relay DOL (4). DMF resistance is added in series with the door motor field, slowing door speed still further. Contacts 5-6 of DOL open, opening the circuit to relay XDO (3). The doors, now fully open, will remain open until the capacitance shunted in parallel with XDO discharges fully allowing XDO to de-energize.

3-99. CAR CALL OPERATION

3-100. The passenger enters the car at the main landing and touches the fourth landing car button (9). The No. 4 touchbutton ionizes. The positive voltage at the touchbutton cathode is applied, through stop brush HCB (9) on the advancer panel and stop contact HCC (9) on the main landing floor bar, to the grid of thyratron XHG (9). The thyratron ionizes, energizing relay HG (9). Relay HJ (6) energizes, completing the operate path for dispatching relays UDR and UDRX (6). Automatic start relay ASR (6) drops out a few seconds later, opening the operate path to MLU (6), SC, SCX (6), XCS (5), and XCSX (2).

3-101. Relay XDO (3) drops out as soon as shunt capacitance is discharged. Pawl magnet relay PM (2) is set, the pawls retract, releasing the lug on the selector and allowing the advancer to move. Stop control relay SE (2) is set, indicating that the elevator should run. Car start relay GO (15) is energized, conditioning the highest call reversal circuit. Relays 1DO and 2DO (4) drop out when XCSX drops, opening the door motor DMA (1) open circuit, and closing the door motor DMA close circuit. The doors start to close.

3-102. Limit contacts 03, 04 and 05 in the control box DOCB (4,10) close. Closure of 05 energizes DOL (4) shorting out door motor field resistance DMF (2), increasing door motor speed. Closure of contacts 03 and 04 merely returns these switches to the position required for the next door-open cycle; it has no immediate effect since 1DO is de-energized. Contact C4 closes, removing resistance from REA, increasing motor speed. As the door nears its fully closed position, the following limit contacts operate:

Contact	Position	Result
06	closes	Energizes XMC (15)
C2	closes	Energizes PMY, PMZ (15)
C3	opens	Adds resistance to REA (10), decreases motor speed.

Contact	Position	Result
C1	opens	De-energizes relay GH (2), extinguishing up arrow on landing position indicator and loading light LL on car operating panel
01, 02	open	No effect because 1DO is de-energized

3-103. XMC contacts short out traction motor field MF (10) series resistance, building up motor field strength and energizing relay 2MC (10). Closure of PMY applies power to armature BMA (14) of advancer panel motor on selector. Advancer panel starts to move up. The door is now fully closed.

3-104. Gate contact GS1 (16) in the door operator control box and contact DS (16) on the hoistway door interlock are closed, when the doors are closed. Setting of the pawl magnet had closed selector stopping contacts SLS1 through SLS8. Relays ADV (10), ADVX (10), UX (16) and HX (16) operate, followed by relays BK (17), HY (17), GK (17), U (13), H (13), HSL (13), RUN (6) and RUNX (6). Generator compensating field GCF (11), leveling field GLF (11), and shunt field GF (11) are energized. Leveling field resistance LFR, partially shorted out by HSL contacts, provides the first speed step during acceleration. HY contacts energize TL (13) a fraction of a second later. Closure of TL contacts provide a second speed step. BK contacts energize the solenoid-operated brake B (11). Action of brake is made slow enough to allow generator field to build up, providing upward tension on car. Brake B (11) lifts and car starts moving up. Brake contact BS (17) opens as a result of lifting motion of brake, but BK stays in through SE and RSE. Contacts 5-6 of HX complete feedback path around MA-GA (11), preventing motor-generator set motor voltage variations from affecting elevator speed.

3-105. As the car moves away from the landing, door zone contacts DZ1 and DZ2 (7) on the front selector open, the automatic reversal brush ARB (5) de-energizes relay ML (5), and the RSFB brush de-energizes relay SFR (8). Relays LA, BPR and HUD (11) energize through contacts 11-12 of HY. Relay OFR (11) energizes through contacts 3-4 of BK. Relay SF (11) energizes through contacts 1-2 of CX to provide the correct generator series field excitation during full speed run. Relay LWT (14) energizes, holding in RC and TC (12). Relay LWX (14) energizes, disconnecting load weighing switches 1LW-8LW (12). This is necessary to prevent false actuation of these switches during acceleration.

3-106. Relays LAT and LATX (14) and NT and NTX (3) energize. Relay XDO (3) energizes through NT contacts, readying the door-open circuit.

Relay 1XE (18) de-energizes when LA5-6 contacts break. Release of 1XE energizes the first speed switch 1E (17) and its auxiliary 1EX (17), shorting out part of the generator shunt field resistance GF (11), initiating the first step of acceleration.

3-107. Relay GCR (21) energizes, indicating to the dispatching system that at least one car is operating as part of the group. Residual field switch RFS (15) sets; switch position shows the direction of the last main operation of the elevator so that the effect of residual voltage can be compensated for during leveling. Relay 2XE (18) de-energizes, causing 2E (17) to energize and initiate the second step of acceleration.

3-108. Leveling switch LV (17) energizes, lifting the leveling contacts out of the way of the selector cams which have now started to move rapidly as the elevator accelerates. Since less current is required to hold the brake off the pulley than to lift it, relay BK (17) is de-energized by the opening of 2E contacts, and resistance is added in series with the brake solenoid B (11), holding the brake shoes just off the pulley. Relay 3XE (18) is released by contacts of 2E causing 3E (17) to energize and initiate third step of acceleration.

3-109. Leveling contacts LV3 and LV4 (7) close, energizing L (7), and completing a hold-in circuit for UXand HX (16). Relay 4XE (18) de-energizes a few seconds later, energizing relay 4E (17) and initiating the fourth step of acceleration.

3-110. Relay FXE (18) de-energizes, dropping "one-floor run" relay OFR (11) and energizing relay FE (17). Had this been a short run, (FXE would not have de-energized) OFR would have been energized at the time of deceleration, shunting a resistor across the LFR resistance to increase leveling field strength. Relay FE energizes, initiating the fifth and final step of acceleration. Relay XMC (15) de-energizes a few seconds later, reducing current in traction motor field MF (less torque is required during running than during acceleration) and energizing relay 1XE (18). Should an emergency stop be required, relay 1XE will put damping resistor GFC around generator field at the moment when largest transients are present in loop. Relay FBS (14) is de-energized. Generator armature GA (11) voltage builds up to rated value and motor armature MA (11) accelerates up to speed. Elevator car runs up at full speed.

3-111. While the elevator travels up, a hall call for the top landing is registered. The hall button HB (20) lights up in registering the call; the hall call relay HCR (20) is energized.

3-112. SLOWDOWN AND STOPPING. As the elevator travels up the hoistway, the selector crosshead panel travels in synchronism with the elevator. Floor bars located on the selector are positioned to agree with landings in the hoistway. PIB (26) brushes on the crosshead panel touch PIC (26) contacts on the floor bars as they pass each other to operate the car position indicator lights.

At the same time, the advancer panel travels up the selector, always one or more floor bar ahead of the crosshead, to operate the hall lanterns and initiate the stopping sequence. There are two calls registered - a car hall for the fourth floor and a hall call for the top floor.

3-113. When stop brush HCB (9) on the advancer panel touches stop contact HCC (9) on the fourth-floor floor bar, it opens break contacts 1-2. Since no car call exists above the fourth floor, the positive voltage that fired thyratron XHG (9) is removed. The thyratron grid remains connected to bias voltage (CB-), its plate to the a-c potential at pin 7 of transformer CTR. The thyratron de-ionizes when the a-c potential decreases until the plate-cathode voltage is less than 8 volts and, because the grid is at a negative potential, the thyratron will not re-ionize when the a-c voltage builds up on the next half-cycle. Relay HG (9) de-energizes, indicating that the elevator has answered the highest car call.

3-114. When stop brush CAB (9) on the advancer panel touches stop contact CAC (9) on the fourth-floor floor bar, the positive voltage present at the cathode of the fired touchbutton tube 4C is applied to the grid of the thyratron XCB (9), ionizing the thyratron and energizing relay CBS (9). This indicates that the elevator is approaching a floor with a car stop registered and that the stopping cycle should be initiated. The selector rocking contact SRC (9) closes and, with contact 1-2 of CBS, resets the pawl magnet. The pawls commence to extend, preparatory to locking the advancer panel to that floor bar.

3-115. Relays GO and PMY (15) are de-energized by the pawl magnet reset, cutting off power to the advancer motor BMA (14), and locking the advancer panel to the fourth-floor floor bar. Break contacts of the GO relay light the UP hall lantern at the fourth floor through brush ULB (25) on the advancer panel and contact ULC on the fourth-floor floor bar.

3-116. Relay XMC (15) energizes, strengthening the traction motor field in anticipation of the deceleration sequence. Stop control contact SCC (15) starts riding along its cam and relay SE (15) resets. Relay FBS (14) is energized, but feedback will not become effective until relay FE is de-energized. However, FBS de-energizes GK (17), transferring the deceleration portion of the GF resistance into the generator field control circuit.

3-117. With the advancer panel locked to the floor bar, the crosshead catches up with it as the landing is approached. This action causes the SLS cams to open the SLS contacts in a predetermined sequence at preset distances from the landing. SLS1 is the first such contact to open, de-energizing relay FE (17), and initiating the first step of deceleration. Contact SLS2 opens next, de-energizing relay 4E (17), initiating the second step of deceleration. Delayed-action relay FXE (18) energizes. Selector stopping contact SLS3 opens, relay

3E (17) de-energizes, initiating the third step of deceleration. Relay 4XE (18) energizes. Selector stopping contact SLS4 opens, relay 2E (17) de-energizes, and the fourth step of deceleration is initiated. Relay 3XE (18) is energized.

3-118. Leveling switch LV (17) is de-energized, lowering the pie-shaped leveling cam into the same plane as the leveling switch contacts. The leading edge of the leveling cam picks up and closes leveling switch contacts LV2, LV6, LV8, LV10 and LV12 (13). Selector stopping contact SLS5 opens and relays 1E (17) and 1EX (18) de-energize, initiating the fifth step of deceleration.

3-119. Selector stopping contact SLS6 opens, de-energizing relays ADV and ADVX (10). Relay GCR (21) de-energizes. Relay 2XE (18) energizes. Operation of contacts SLS7 and SLS8 is described in paragraph 3-141.

3-120. At 17-1/2 inches from the landing, the leveling switch cam opens leveling switch contacts LV3 and LV4, de-energizing relay LI (7). Relays UX and HX (16) are depenergized by ADVX and LI, disconnecting the generator shunt field GF, and connecting the leveling field GLF. Relay HY (17) is de-energized, turning off the hall lantern at the fourth floor (25). The car slows down to high-speed leveling of 60 fpm as dictated by relay HSL contacts which short taps 6 through 8 of the LFR (11) resistance. At 9 inches from the landing, the leveling switch cam opens leveling contact LV12, de-energizing relay HSL (13) slowing down the elevator to 35 fpm as determined by relay TL shorting together contacts of leveling field resistor LFR. At 4-1/2 inches from the landing, leveling contact LV10 is opened by the leveling switch cam, de-energizing relay TL (13) a few seconds later, de-celerating the car to 20 fpm.

3-121. The leveling switch cam closes door zone contacts DZ1 and DZ2 (7), energizing relay DZA which, in turn, energizes relay 1DO and 2DO (4). The doors start to open. The leveling switch cam opens contact LV8 followed by LV6. Switch U de-energizes (13), followed by switch H (13) a few seconds later. Generator compensating field GCF (11) and leveling field GLF (11) are disconnected. Brake solenoid B (11) is de-energized; spring action presses the brake against the brake pulley.

3-122. The following relays are de-energized:

Relay	De-energized By	Principal Result
LA (11)	H	Energizes 1XE (18)
BPR (11)	H	Shorts out B2 resistance across brake coil (11) permitting "harder" brake operation during releveling

Relay	De-energized By	Principal Result
HUD (11)	H	Shunts rectifier across H coil (13), speeding relay dropout.
SF (11)	H	Shorts generator shunt field GSF (11) to dissipate residual field quickly, avoiding oscillatory stop.
LAT (14)	LA	Conditions brake and leveling field circuits (11) for double dead zone releveling.
LWT (14)	BPR	Opens RC, TC and HC (12) hold-in circuits, preparatory to use of load-weighing circuit.
LATX (14)	LAT	Releases RUN (6) relay
LWX (14)	LWT	Adds resistance to damp GLF (11) residual field, preparatory to releveling operation; makes load weighing circuit effective again (12).
NT (3)	TL	De-energizes NTX (3)
RUN (6)	LATX	Conditions automatic reversal circuit DG (5).
ASR (6)	NT	De-energizes XCS (5), MLU (6); holds in K (7)
XDO (3)	NT	Time-delay relay; door remains open until relay times out and de-energizes.

3-123. Break contacts of RUN relay connect cathode of fourth-floor touchbutton tube to a-c voltage at heater of thyratron XCB (9); positive alternation of this voltage reduces touchbutton plate-cathode potential until tube de-ionizes. When the touchbutton tube de-energizes, the positive voltage at CA4, the fourth-floor floor bar disappears, leaving only the negative voltage to which the grid of thyratron XCB is connected and the a-c voltage at the plate. The next time the a-c voltage decreases until XCB plate-cathode voltage is less than 8 volts, the thyratron de-ionizes and, because the grid is at a negative potential, the thyratron will not re-energize when the a-c voltage again builds up. Relay CBS (9) de-energizes.

3-124. The car stops level with the floor. The door is fully open. The touch-button and hall lantern are extinguished.

3-125. HALL CALL OPERATION

3-126. After the passenger leaves the car at the fourth floor, relay XDO (3) times out, de-energizing relays 1DO and 2DO (4) causing the doors to start to close. When the doors close fully, the elevator accelerates and runs full speed up the hoistway to answer the hall call at the top floor.

3-127. When stop brush HHB (20) on the advancer panel touches stop contact HHC (20) on the top-floor floor bar, relay HJ (20) is de-energized. This occurs because the rectifier between terminals 10 and 15 in THC blocks d-c, leaving only a bias voltage (B-) on the grid of thyratron XHJ (20); the thyratron will de-ionize the next time the a-c voltage on the thyratron plate decreases below the 8 volts necessary to sustain ionization. Once the thyratron de-ionizes, relay HJ de-energizes. Dropout of relay HJ signifies that the highest upward call has been answered. Highest call reversal relay HR (6) and top selection relay SCT (6) energize: relays HRX (6) and HRY (6) de-energize.

3-128. When stop brush DHB (20) on the advancer panel touches stop contact DHC on the top-floor floor bar, it applies the positive potential existing on the floor bar to the grid of thyratron XHS (20), firing the thyratron and energizing relay HS (20). The selector rocking contact SRC (9) closes, resetting the pawl magnet and initiating the slowdown and stopping sequence described in paragraphs 3-112 through 3-124.

3-129. Relays GO and PMY (15) are de-energized by pawl magnet reset, cutting off power to advancer motor BMA (14), locking the advancer panel to the top-floor floor bar. Break contacts of the GO relay light the top floor hall lantern (25) through brush DLB on the advancer panel and contact DLC on the top-floor floor bar. Break contacts of PMY connect the a-c voltage at the cathode of thyratron XHS (20) to the cathode of the top floor touchbutton; the touchbutton de-ionizes during the positive alternation when its plate-cathode potential difference falls below 8 volts. The bias voltage at the touchbutton grid is applied to the grid of thyratron XHS; the next time the a-c plate voltage of the thyratron decreases, the thyratron will de-ionize and will not re-ionize on the next positive alternation of plate voltage because of the negative grid potential. Relay HS (20) de-energizes when the thyratron de-ionizes, indicating that no more hall calls exist in the given direction.

3-130. Switch DG (5) resets (i.e., releases) through make contacts of HR, conditioning circuits that will reset the car touchbutton and direct the elevator downward. Up direction relays DGU (15), DGV (5), and DGX (5) de-energize; up dispatching relays UDR (6) and UDRX (6) de-energize. Down direction relays DGD (15), DGE (5) and DGF (15) energize.

3-131. Any car calls still registered on the car operating panel are now cancelled by momentary interruption of the touchbutton plate voltage. Momentary dropout of electronic button reset relay EBR (5) occurs when DGE (5) is energized and DGV (5) de-energized on DG reset: shunt capacitors cause DGE to energize quickly and DGV to de-energize slowly. There exists a moment, therefore, when break contacts of both DGE and DGV are open, causing the momentary dropout of EBR, hence momentary loss of touchbutton plate voltage.

3-132. Release of relays SCT and HR (6) resets the highest call reversal circuit. Release of relay DGV turns off UP direction lights CUDL and HUDL (26) on the car position indicator and on the control and communication panel in the LCC building. Down direction lights CDDL and HDDL (26) come on when relay DGE energizes.

3-133. HOME LANDING OPERATION

3-134. The car is at the top floor with the doors open, as described in the immediately preceding paragraphs. The passenger enters the car and touches the button for the main floor. When relay XDO (3) times out, the doors close as previously explained, and the elevator accelerates to full speed down. The sequence in paragraphs 3-99 through 3-110 is repeated except that down direction switches D (13) and DX (16) operate instead of up direction switches U and UX.

3-135. Slowdown and stopping is initiated when stop brush CEB (9) on the advancer panel touches stop contact CEC (9) at the main-floor floor bar. Leveling commences, but odd-numbered contacts LV1 through LV11 operate instead of even-numbered contacts LV2 through LV12. The car is brought to a full stop with the doors fully open at the main landing, repeating the sequence given in paragraphs 3-112 through 3-124.

3-136. COLLECTION OF BOTH FRONT AND REAR CALLS

3-137. Front and rear selectors are identical in construction except that the front selector has floor bars for 37 stops while the rear selector has floor bars for 10 stops. The selectors are synchronized with elevator motion and with each other so that both crossheads are in the same relative position.

3-138. With calls registered for both front and rear stops, the elevator will collect the calls, in the order in which it reaches the landings and platforms, switching back and forth between front and rear stops, as necessary. For example, if the first call to be answered is a front call, it will be picked up on the front selector and answered. If the elevator rises a little further and comes to a rear call, it will be picked up on the rear selector and answered. The same sequence of operation applies to front and rear stops.

3-139. FRONT-TO-REAR INTERLOCK. Door opening and leveling circuits are interlocked so that, except at the main landing, only one set of doors (either front or rear) can be opened at any one time. Relay RLW contacts 1-2, which open when the elevator is leveling into a rear stop, serve as an interlock to prevent the energizing of front door relay FDR (8) and front leveling relays FLV and FLW (8). In similar manner, relay FLW contacts 1-2 interlock rear door and leveling relays RDR, RLV and RLVR (8).

3-140. Front doors are opened whenever the car stops at the main landing; rear doors will also open if a rear call is registered. Thus, at the main landing only, the front-to-rear interlock is circumvented (by ML contacts) so that front and rear doors can be opened at the same time. Main landing relay ML contacts 1-2 energize front door open relays 1DO and 2DO (4). If a main landing rear car or hall call is registered at the same time, rear doors are opened by R1DO and R2DO (4) through contacts 7-8 of ML plus contacts 7-8 of RCBS (rear car call) and/or 7-8 of RHS (rear hall call).

3-141. ADVANCER CAM OPERATION: GREATER THAN 33 INCHES BETWEEN FRONT AND REAR STOPS. Assume that a front stop is to be made, followed by a rear stop at least 33 inches away. The advancer panel of the front selector stops when it reaches the floor bar for the called landing. Power is removed from the rear advancer motor; the rear advancer panel is returned to the rear crosshead, and held there until the front stop is answered. The operating sequence follows.

a. Release of automatic start relay ASR sets both pawl magnets PM and RPM (2) as the elevator starts. Pawls retract to permit advancer movement.

b. Relay GO (15) is energized through PMX and RPMX contacts. Relay CHS is energized through GO contacts 11-12. CHS contacts 1-2 and 3-4 complete the car stop brush feed paths to CAB and RCAB (9). CHS contacts 7-8 and 11-12 complete the hall stop brush feed paths to UHB, DHB, RUHB and RDHB (20).

c. Rear advancer cam relay RAC (7) is energized by PMY contacts 3-4. Closed RAC contacts 3-4 and 5-6 allow the rear advancer motor RBMA (14) to drive up (through DGX contacts 5-6) or down (through DGF contacts 11-12).

d. Front advancer panel BMA (14) is driven in like manner through FAC contacts.

e. The front advancer panel picks up a call, its pawl magnet PM (9) is reset, and the panel latches onto the floor bar.

f. Relay RAC (7) is held in through its contacts 11-12.

g. Power is removed from the rear advancer panel motor RBMA (14) when PMA contacts 3-4 open. Relay GO (15) is released.

h. Relay CHS (4) times out a short time later. CHS contacts disconnect both car stop brushes CAB and RCAB (9) as well as all hall stop brushes UHB, DHB, RUHB and RDHB (20). This action prevents pickup of any rear stop more than 33 inches from the front stop.

i. When the car begins leveling into the front stop, relay LX (13) is energized, dropping relays RAC and RACX (7).

j. RAC contacts 1-2 and 7-8 close. The rear advancer RBMA (14) is pulled back until level with the crosshead through either RSLS7 (to move the advancer down) or RSLS8 (to move it up).

k. Once level with the crosshead, the RSLS contacts open to stop the advancer motor.

3-142. When the front call is answered, the sequence described in par. 3-141 is repeated. This time, however, the rear call is answered while the front advancer panel is retracted to the crosshead by the action of relays FAC and FACX (7).

3-143. ADVANCER CAM OPERATION; LESS THAN 33 INCHES BETWEEN STOPS. Assume that a front stop is to be made, followed by a rear stop less than 33 inches away. For such an unusually short run, the car will not begin a main operation when finished with the front stop; rather, it will simply level into the rear stop.

3-144. Three distinct cases of "short floor operation" will be considered.

a. Front stop is picked up after elevator has traveled at least a normal one-floor distance (approx. 8'-9") so that both advancers are fully extended. This case described in paragraph 3-145.

b. Front stop is picked up before elevator has traveled normal one-floor distance. This case is described in paragraph 3-146.

c. Elevator is stopped at front when call is registered for rear landing less than 33 inches away. This case is described in paragraph 3-147.

3-145. If the elevator has traveled a distance equivalent to one full floor run (8'-9" minimum, 12'-8" average distance between successive front landings), both advancer panels will be fully extended. Each advancer panel picks up its stop. The elevator proceeds to answer the front call, then levels into the rear stop. The operating sequence follows.

a. Both advancer panels move out as described in paragraph 3-141, steps a through d.

b. Both advancer panels extend the full distance.

c. Front advancer panel picks up the stop, resets pawl magnet, and latches onto floor bar.

d. Relay FLV (8) energizes and holds itself in. Relay GO (15) is released; relay CHS (4) starts timing out.

e. Rear advancer panel RBMA (14) picks up rear stop before CHS can finish timing out. Front-to-rear relay FR (8) energizes, as a memory that front-to-rear transfer will be required.

f. Car makes front stop.

g. Relay SFR (8) energizes. SFR contacts 7-8 open the high-speed circuit of UX, DX and HX (16).

h. Relay XRL (8) energizes to transfer the car from front to rear leveling when front door open time has expired (NTX timed out) and front doors are closed (GS released). XRL holds in through its contacts 3-4.

i. XRL break contacts 1-2 release front door open and leveling relays FDR, FDRX, FLV and FLW (8). XRL make contacts 5-6 and FLW break contacts 1-2 energize the rear door open and leveling relays RDR, RDRX, RLVR and RLW (8).

j. Contacts 11-12 of XRL energize relay NT (3) to begin the rear door-open cycle.

k. FLV releases FR (8) and, in turn, XRL (8). Leveling continues, however, because RDR, RDRX, RLW, and RLVR (8) are self-held. FR break contacts 1-2 set the rear pawl magnet RPM (2) in preparation for the next run.

3-146. If the car starts from a landing less than 8'-9" from the short floor pair, the rear advancer is delayed to ensure that the front stop (the nearer stop in this example) will be picked up first. Thereafter, transfer occurs at leveling speed as in the preceding case. The operating sequence follows:

a. Relay NLF (12) is energized, indicating that the next landing is at the opposite side (the front landing in this case) and less than a normal one-floor distance away.

b. The front advancer panel BMA (14) moves out. The rear advancer panel RBMA (14) is restrained by NLF contacts 1-8.

c. The front advancer panel moves out enough to energize ADV and ADVX (10). Rear advancer panel RBMA (14) moves out when ADVX contacts 11-12 close.

d. Front advancer panel picks up the stop, resets pawl magnet, and latches onto floor bar. Relay FLV (8) energizes and holds itself in. Relay NLF (12) releases.

e. Steps e through k of paragraph 3-145 occur.

3-147. If the car is stopped at a short floor, and a call is subsequently registered for the opposite floor of the short-floor pair, transfer to the opposite side takes place at leveling speed. The transfer circuit is then locked out to prevent a second transfer action.

a. Transfer relays XFL and RFA (8), or XRL and FR (8), energize through SFR contacts 11-12, initiating transfer at leveling speed as described in the preceding paragraph.

b. One-time transfer relay OTT (8) energizes through FR or RFA contacts 11-12, then holds in through its own contacts 11-12. OTT remains energized until IEX makes on the next main operation.

c. OTT break contacts 7-8 break the path to the transfer relays XFL, etc (8), preventing a second transfer operation.

3-148. FRONT-REAR STOP SELECTION: BOTH PAWL MAGNETS RESET SIMULTANEOUSLY. Normally, front or rear stop selection is determined by which pawl magnet was reset first. Should both pawl magnets reset simultaneously, (i.e., both PM2 and RPM2 open), dropping both PMZ and RPMZ, relay BFR (7) will be energized. BFR contacts 3-4 then close, energizing FDR, FLW, and FLV (8), forcing a front stop pickup.

3-149. INDEPENDENT SERVICE

3-150. With the IND SERVICE - GROUP toggle switch "ISS" in the IND SERVICE position, relays IS and ISX (2) are de-energized. When the elevator is operated independently of the group, the following actions occur:

a. All car calls are cancelled by the momentary interruption of touch button plate power caused by momentary dropout of relay EBR (5). This relay is released in the short interval between the opening of IS contacts 5-6 and the delayed closing of ISX contacts 1-2. ISX dropout is delayed by the capacitor shunted across its coil.

b. Hall calls are bypassed by ISX contacts 3-4 opening to release relay NSX (6). Contacts 3-4 of NSX open the path from the UHB brush (20) on the advancer panel to thyratron XHS.

c. Automatic door closure is disconnected by ISS switch releasing relays ATT and ATTX (2). To close doors, FDC or RDC button (DCB2 or RDCB2) must be held pressed, energizing relay AIS (5), releasing door re-open relay RO (3), in turn releasing relays 1DO and 2DO (4).

d. Elevator is allowed to start automatically when doors are closed by the release of ASR (6) relay through break contacts 1-2 of AIS. (ASR coil not affected by MLU and UDRX contacts because these relays are de-energized by open ISX contacts 3-4.)

e. Elevator starts down toward the lobby [closing of IS contacts 7-8 resets DG (5) relay] unless contacts 7-8 of HG are open, indicating a registered car call above the car.

f. Car calls registered in independent elevator are kept from automatic peak selection circuit APS (24) by the opening of ISX contacts 5-6.

g. Zone return feature (9) is disconnected by opening of ISX contacts 11-12.

h. Relay GCR (21) is de-energized if both elevators are on independent service or if one elevator is on independent service and the other is stopped. GCR release institutes emergency car dispatch when relay WLD (22) times out.

i. A car on independent service can be removed from service by turning STOP-START GENERATOR keyswitch (3) on the lobby control panel to the STOP position. Keyswitch releases door reopen relay RO (3), releasing relays 1DO and 2DO (4), closing car doors. With contacts 11-12 of 2DO open, relay ETS (5) times out to drop relay K (7) and shut down the motor-generator set.

j. Except for up dispatch lights UDC and XUDC (26), the features introduced by attendant operation are also introduced in independent service by the release of relays ATT, ATTX, LRC, RLRC, and HBF (2). Par. 3-152 contains a description of these features.

k. Up dispatch lights UDC and XUDC (26) do not operate on independent service because both UDS pull-in windings (2, 6) are disconnected at this time. Down dispatch lights DDC and XDDC (26) operate under control of DGE contacts 11-12.

3-151. ATTENDANT OPERATION

3-152. With the AUTO-ATT toggle switch (ATS) in the ATT position, relays ATT, ATTX, LRC, RLRC and HBF (2) are de-energized. The following operating features are introduced.

a. Front and rear light ray devices LRCU and RLRCU (1) are disconnected by the dropout of LRC and RLRC. Car buzzer BU (25) is disconnected by the opening of ATTX contacts 1-2.

b. The delay in ASR (6) dropout is removed by the opening of ATTX contacts 3-4.

c. Automatic door re-opening RO (3) under control of relay ASR is disconnected by the opening of ATT contacts 11-12. Operation of XDO (3) under control of relays GO and HS is disconnected by the opening of ATT contacts 3-4.

d. Door close buttons DCB2 and RDCB2 (5) are made effective by the opening of ATT contacts 1-2. NON-STOP button NSB (6) is made effective by the opening of ATT contacts 5-6.

e. Dispatch lights UDC and DDC (26) operate under control of UDS pull-in winding 12-13 (6) as in automatic operation. Hence, for up dispatch light UDC (26) illumination, SC (6) must be energized (DGX energized to establish up direction of travel and car stopped at main landing with doors open), a hall call must exist (HJ energized), up dispatch signal must have been given at expiration of automatic interval (GUD released) and car-time relay NT must have released. For down dispatch light DDC (26) illumination, UDS must be released and DGE energized. However, note that UDS pull-in winding 9-10 (2), which permits up dispatch prior to expiration of automatic interval, is disconnected on attendant operation by the opening of ATTX contacts 7-8.

3-153. INSPECTION OPERATION

3-154. INITIATION OF INSPECTION. With the INSP-OFF toggle switch (IIS) in the INSP position, relays 1INS and 2INS (2) are de-energized as well as the ATT, ATTX, LRC, RLRC and HBF (2) relays de-energized during attendant operation and the IS, ISX and ISY (2) relays de-energized on independent service. Auxiliary access keyswitch relays AUD and AUDX (2) are energized.

a. The following automatic operations are cancelled:

1. Extended main landing time circuits
2. Front and rear light ray devices
3. Car buzzer
4. Automatic door re-opening through relay ASR
5. Hall and car call collection

b. Door re-open relay RO (3) energizes. Car and hoistway doors are opened when relay RO contacts 1-2 energize 1DO and 2DO (4). Automatic door-open timing relay XDO (3) is disabled by contacts 3-4 of relay 1INS. Power door-closing is disabled by contacts 1-2 of AUD which disconnect the door reactor REA (10) control winding from the close contacts in the door operator control box.

c. Relay K (7) is held in by contacts 7-8 of 2INS to keep the motor-generator set running despite the dropout of excitation time relay ETS (5). Relay SE (2) set coil is held in by contacts 7-8 of 1INS to keep the car run circuit energized without the use of automatic start relay ASR.

d. Leveling coil LV (17) is energized by the closing of contacts 5-6 of 2INS, lifting the leveling switch contacts so that they will not be subject to bounce during the inspection operation. Selector leveling contacts LV1, etc. (13) are electrically disconnected by the opening of contacts 11-12 of 1INS.

e. High-speed elevator operation is disabled. Contacts 11-12 of 2INS open line to selector advancer panel motor BMA (14). Contacts 5-6 of 1INS (16) open the high-speed direction circuit controlled by relays ADVX and PMX. Contacts 3-4 of 2INS (17) open the path to the speed control relays.

f. Top-of-car and access key operation (16) is conditioned by the closing of contacts 1-2 of both 1INS and 2INS.

3-155. ACCESS KEY OPERATION. Operation of access keys TAK and BAK (16) is conditioned by the closing of contacts 11-12 of AUD as well as contacts 1-2 of 1INS and 2INS. To gain access to the top of the car, the elevator is sent to the upper terminal, the inspection initiating switch placed in the INSP position, and the following procedure performed:

a. The inspector inserts his key into access key switch TAK (located adjacent to the hoistway door at the top landing) and turns it to the position marked "D". Section TAK2 (16), with closed contacts 5-6 of AUD, will short out gate switch GS1 in the door operator control box and hoistway door interlock DS at the upper landing. Simultaneously, section TAK1 (16), with closed contacts 11-12 of AUD, will energize relays DX and HX to move the elevator down.

b. When released, TAK springs back to neutral, opening the interlock circuit, releasing relays DX and HX, and stopping the elevator.

c. To return the elevator to its normal operating position, TAK is turned to the position marked "U". Section TAK2 again bypasses the interlock DS and gate switch GS1; section TAK1 energizes relays UX and HX to move the elevator up.

d. To gain access to either the elevator pit or the bottom of the car, a similar sequence is performed at the lower landing using access key switch BAK.

3-156. TOP OF CAR INSPECTION. Once access to the top of the elevator has been gained, the inspector operates top-of-car inspection switch TCI (2) to the INSP position. This action de-energizes relay AUD, disabling access key switches TAK and BAK (16), conditioning the top-of-car inspection buttons. Relay GH (2) is de-energized; its contacts 7-8 release relays 1DO and 2DO (4), closing the car doors. Relay GS (2) is de-energized, disabling the leveling relays.

CAUTION

There are still two methods of operating the elevator -- by use of the top-of-car inspection buttons and by manual operation of main controller switches ("H" plus either "U" or "D"). The inspector must make certain that main controller switches are <u>not</u> operated at this time.

3-157. After manually closing the hoistway door, the elevator can be moved downward by maintaining continuous pressure on both the control inspection button CIB (16) and the adjacent "D" (down) button TDIB (16). Both relays DX and HX (16) remain closed as long as both inspection buttons are pressed. Releasing either button will stop the elevator and set the brake.

3-158. To move the elevator up, the inspector maintains continuous pressure on CIB (16) and the "U" inspection button TUIB (16).

3-159. <u>EMERGENCY OPERATION</u>

3-160. AUTOMATIC GROUP CUTOUT

3-161. Failure of a car to leave a terminal within a predetermined time removes that car from the group and permits normal operation of the remaining car. The car returns to service when it starts.

3-162. When the doors start to close, relays NT (3), XDO (3), ETS (5), ETSX (5) and ASR (6) release in that sequence, and XCS (5) starts timing out. Normally, the car starts before ETSX times out, and relays TL (13), NT, ASR, and XCS energize in that sequence. If the car fails to start, however, TL does not energize so that ASR times out and its contacts 11-12 remove the car from the group by releasing MLU (6) and SC (6). MLU contacts 11-12 hold ASR (6) released until the car is able to start.

3-163. EMERGENCY DISPATCH

3-164. If a circuit failure prevents the intended dispatch of elevators, an emergency dispatching device will dispatch the cars from the terminals. This operation will continue as long as normal dispatching fails to take place.

3-165. If a car call exists above any car in service, its HJ (6) relay will be energized. If a hall call exists, HCR (20) and HCS (21) relays will be energized. If either a high car or hall call exists without a car running (i.e., GCR relay de-energized), relay WLD (22) times out and de-energizes relay WLDX (22). Relay WLDX in turn de-energizes each ASR (6) relay, thereby dispatching the car. Relay WLD discharges very slowly to assure that an available car is given sufficient time to start to answer the call. The WLD coil also energizes slowly in order to allow sufficient time to start all the cars.

3-166. Dispatch Failure lamp WL (25) lights on the control and communication panel through break contacts 5-6 of WLDX.

3-167. SELECTIVE STOPPING ON HALL BUTTON POWER SUPPLY FAILURE

3-168. The hall button power supply is tested continuously by a touch button tube on the PST panel (20). If the supply voltage is above the critical value for hall button "touchability", the PST touchbutton tube fires, relay PSS (20) energizes, contacts 3-4 open to interrupt the plate supply and de-energize the tube, and the cycle repeats. PSS remains energized due to the capacitor discharge through its coil. PSS in the energized state indicates that B+, BO and the touchbutton firing voltage (HL1) are satisfactory.

3-169. If the voltage falls below the critical value, the tube does not refire and relay PSS (20) times out. If contacts 5-6 of PSS remain open until relay PSX (21) times out, contacts 1-2 of PSX energize hall button failure relay HBF (2).

3-170. Contacts 3-4 of HBF apply a positive voltage to contact HCC (9) on the top-floor floor bar, equivalent to registering a top floor hall call. Contacts 5-6 of HBF apply a positive voltage to contact CEC (9) on certain floor bars, causing the elevator to stop at these floors.

3-171. ELEVATOR POWER SUPPLY FAILURE INDICATOR

3-172. When the motor-generator set has been shut down by normal means, position indicators, car lights, and fans will be turned off. If elevator shutdown is caused by power failure or operation of an overload relay, the position indicators, car lights and fans will remain on.

3-173. During normal operation, contacts 5-6 of running switch K will energize switch L (7) to start the motor-generator set and reset power failure indicator relay PFI (7). Relay PFI remains reset until switch K is de-energized.

3-174. Switch K (7) is normally released either by the timing out of the ETS relay (i.e., no call received for at least 2 minutes) or by placing the STOP-START MOTOR GENERATOR keyswitch (on the control and communication panel in the LCC building) in the STOP position. Contacts 7-8 of switch K energize the PFI set coil when K drops. PFI break contacts 1-2 turn off the position indicators (26), 5-6 turn off the car lights (26), and 7-8 turn off the fans (26).

3-175. Two types of abnormal conditions will cause the release of switch K (7) - an overload (opening of any of contacts 1P through 3P) or loss of both emergency and normal power (opening of both NP contacts 1-2 and EP contacts 3-4). PFI set and reset coils will be de-energized and PFI break contacts will keep the position indicators, car lights, and fans energized.

3-176. EMERGENCY POWER SUPPLY

3-177. When normal power is lost, relay NP (23) de-energizes and the following circuit actions occur:

a. The NORMAL POWER SUPPLY lamp NPL (25) for that elevator on the control and communication panel is turned off as NP contacts 7-8 open.

b. NP contacts 5-6 close a permissive circuit (23) to provide emergency power for either elevator A or B. To place the elevator on emergency power, its Emergency Power keyswitch on the control and communication panel is closed and its EP relay is energized.

c. The EMERGENCY POWER SUPPLY lamp EPL (25) for that elevator on the control and communication panel is lighted through EP contacts 5-6.

d. If neither emergency power is available (EP contacts 3-4 open) nor group normal power [NP (A) contacts 1-2 and NP (B) contacts 3-4 open], PFI set coil (7) is de-energized.

3-178. EMERGENCY SERVICE

3-179. Momentarily operating its EMERGENCY SERVICE keyswitch 2FIS (2), located on the LCC building control and communication panel, will remove that car from group operation and return it to the main landing.

a. Emergency service relays FIS, FISX, 1FIS, and 3FIS (2) energize.

b. Relay 2FIS (11) energizes through 1FIS contacts 11-12.

c. Relays FIS, FISX, 1FIS, and 3FIS (2) are held energized through 2FIS contacts 1-2 after release of the keyswitch.

d. Dispatching Failure lamp WL (25) will illuminate at the LCC control and communication panel.

e. Buzzer BU (25) will sound in the car, informing passenger that car has been commandeered for emergency use.

f. All car calls are cancelled and car buttons rendered ineffective through release of relay EBR (5) by 1FIS contacts 1-2. Hall calls will be ignored through release of independent service relays IS and ISX (2) by 1FIS contacts 7-8.

g. Relays ATT, ATTX, LRC, and RLRC (2) are released by 1FIS contacts 7-8, disconnecting light ray devices, automatic door closure, and automatic door reopening as in attendant operation. However, attendant's front and rear door open buttons DOB and RDOB (4) are disconnected by FIS and FISX contacts 5-6. Delayed car cutout relay XCS (5) is released by FIS contacts 7-8, removing car from group operation.

h. If the car is traveling down, it will continue non-stop to the main landing.

i. If the car is traveling up, reset of PM (9) through 2FIS contacts 3-4 will cause the car to stop at the next front landing. Doors will not open because relays XDO and RDXO (3) are disconnected by open ATT, HS, and NT contacts. Direction relay DG (5) will reset through 3FIS contacts 1-2, causing car to reverse to the down direction. Release of relay ASR (6) through AIS break contacts 1-2 will start the car. Pawl magnet PM (2) will set through ASR break and FIS make contacts. Elevator will then travel non-stop to the main landing.

j. If the car has initiated a stop, it will complete the stop without opening its doors, then travel non-stop to the main landing.

k. If the car is waiting to be dispatched at the upper terminal, door reactors REA and RREA (10) will be energized in the closing direction through resistance C4 (in the circuit because XCS contacts are open), causing doors to close at slow speed. Release of automatic start relay ASR (6) by 1FIS contacts 5-6 will dispatch the car. Elevator will travel non-stop to main landing.

l. When car arrives at main landing, door time relay NT (3) is energized through MLY and 1FIS contacts, and emergency service relays FIS and FISX (2) are released by MLY contacts 1-2. Front and rear doors open.

3-180. With the car at the main landing and its doors open, the INDEPENDENT SERVICE keyswitch ISS (2) in the car is operated. Emergency service relays 1FIS (2), 2FIS (11), and 3FIS (3) are released. Buzzer BU (25) is silenced and warning lamp WL (25) is extinguished. Operation is now the same as in independent service.

a. The car will respond to calls registered on its own car buttons, but not to hall calls.

b. Doors can be closed by constant pressure on a door close button DCB. Doors open automatically at the selected floor.

c. If the incorrect car button was touched, the INDEPENDENT SERVICE keyswitch is turned to the left and then to the right to cancel the call, and then the correct car button is touched.

SECTION IV

PREVENTIVE MAINTENANCE

4-1. SAFETY PRECAUTIONS

4-2. Observe safety precautions at all times. Open power line (by operating emergency STOP switches) when working in the pit or on top of car. Wherever possible, perform preventive maintenance procedures with power off.

4-3. Control circuits operate on 450 volts. Therefore, use extreme caution when working on energized equipment. Note that cutoff switch COS can be used to turn off selector power and that main controller knife switch KS can be used to de-energize the system.

4-4. ROUTINE PERIODIC INSPECTION

4-5. HOIST ROPES. Inspect hoist ropes as follows:

a. Inspect for worn or flattened strands and broken wires on the outside of a cable. However, lack of visible wear is no indication of the condition of the wires. If cables are badly rusted, inside wires may be injured, making further use of the cable dangerous.

b. Check rope tension by measuring length of equalizing springs. Unequal rope tension, as indicated by an equalizer spring noticeably shorter or longer than the others, causes unequal wear of the sheave grooves and shortens rope life. In adjusting tension, turn nut at bottom of thimble rod. Do not turn thimble rod itself as this will cause an undesirable twisting of the hoist ropes.

c. Check rope lubrication. Rope should be lubricated only if completely dry to the touch.

4-6. GOVERNOR ROPE. Inspect governor rope periodically and replace if it shows signs of wear. If completely dry to the touch, rope may be lubricated sparingly. Governor jaws must be able to grip and hold rope when the governor trips.

4-7. MOVING PARTS. Examine moving parts, particularly safety linkage, for freedom of movement. Clean, free binds, and lubricate as necessary. Replace any parts that are worn to the extent of making operation uncertain.

4-8. BRAKE. Check brake adjustment per paragraph 6-19d. Check condition of brake lining.

4-9. CONTACTORS AND RELAYS. Check for existence of the following faults:

a. Collection of dirt and gum
b. Excessive heating of parts evidenced by charred insulation or odor.
c. Corrosion
d. Loose connections
e. Worn or broken mechanical parts.
f. Evidence of airborne sand or condensate falling on components.
g. Incorrect contact pressure and wipe.
h. Worn contacts.
i. Incorrect rectifier voltage (Normally 125-135 volts, d-c)
j. Binding of moving parts.
k. Excessive arcing when contacts open.
l. Excessive slam on pickup.

4-10. CABLES. Inspect all electric cables and wiring for broken wires, loose lugs, and loose connections.

4-11. LUBRICATION

4-12. LUBRICATION CHART

4-13. Lubrication points, types of lubricants to be used, and frequency of lubrication are given in Table 4-1.

4-14. SPECIAL LUBRICATION INSTRUCTIONS.

4-15. CHOICE OF LUBRICANTS. Lubricants listed in Table 4-1 meet the special requirements of the elevator industry. Unless otherwise indicated, substitution of lubricants or use of general-purpose lubricants is deleterious to elevator performance.

4-16. ROPE LUBRICATION. Ropes are lubricated periodically to retard corrosion, maintain flexibility and to lessen wear of the sheave grooves. Excessive lubrication, however, will cause loss of traction and impair elevator safety. To help assure proper lubrication:

a. Lubricate only when ropes are dry to the touch.

b. Clean ropes with stiff brush or broom.

c. Lubricate sparingly. Apply lubricant with small brush, or with commercially available wire-rope lubricant applicator device. Approximately 6 quarts of lubricant will be required for the hoist ropes. Approximately 1 quart of lubricant will be required for the governor rope.

d. Run the elevator on inspection when applying lubricant.

e. Place a pan under the car crosshead hitch immediately after lubricating hoist ropes to catch any surplus oil. Pan should remain there until the oil no longer drains from the ropes.

4-17. ROLLER GUIDES. Car and counterweight guide rails must never be lubricated. Lubricate wheel bearings of roller guides per Table 4-1.

4-18. CLEANING AND TIGHTENING

4-19. Clean interior of controller and selector cabinets to remove accumulated dust. Clean machine room, top of car, and guide rails at regular intervals.

CAUTION

Before extensive use of elevator cleaning compound, protect skin by applying "Practi-Creme" or similar product to arms and hands.

4-20. Tighten all loose connections and replace wearing contacts of contactors and relays as required. Tighten all bolts, couplings and fastenings.

4-21. After maintenance, replace and securely clamp all access doors and panels.

TABLE 4-1
LUBRICATION

LUBRICATION POINT	FIG. REF.	LUBRICANT	NOTES
MACHINE	8-33		
Ball and roller bearings		Code 02-002	Inspect every 6 mos. Regrease every 4 yrs.
Brake core			
Rulon Bushings			Inspect annually
Pins		Code 25-205	Lubricate every 2 mos.
Pins with grease fittings		Code 02-002	Lubricate every 6 mos.
MOTOR-GENERATOR SET	8-36		
Motor and Exciter bearings		Code 07-180	Lubricate yearly; with motor-generator set stopped, lift lid on oil cup and fill to indicated level.
MAIN AND DISPATCHING CONTROLLERS	8-43, 8-44	None	Inspect every other week. Clean every 6 mos. When required, apply 1 drop of oil per pin.
Relay hinge pins			
SELECTOR			
Bearings	8-38, 8-39	Sealed	Inspect every 3 mos.
Oil ports and cups.		(	
Small rollers on leveling switch		(Code 25-205	Lubricate every 3 mos.
Link and lever pins		(	
Square guide rods for switch lever and brush magnet		Code 08-010	Lubricate every 6 mos.
Tape Sheave Bearing (Tension)	8-37	Code 02-002	Lubricate every 6 mos.
Toothed Tape	-	Code 25-205	Lubricate every 6 mos. Apply with clean cloth and wipe.

TABLE 4-1
LUBRICATION

LUBRICATION POINT	FIG. REF.	LUBRICANT	NOTES
GOVERNOR	8-30		
Grease cups		Code 02-002	Caution: Keep lubricant fron rope jaws and gear segments.
Hinge pins		Code 25-205	Lubricate every 6 mos.
Bevel gears		Code 02-002	-
SECONDARY SHEAVE	8-35	Code 02-002	Inspect every 6 mos. Regrease every 4 yrs.
ROPES	-	Code 07-750	Inspect every 2 mos. When absolutely dry to the touch, apply lubricant sparingly.
TENSION AND IDLER SHEAVES			
Governor sheave		Code 02-002	Inspect every 6 mos.
Compensating sheave	8-20		
SAFETY			
Hinge and link pins	8-17, 8-18	Code 25-205	Lubricate every 6 mos.
Pivot points			
Actuating screws			
HOISTWAY LIMIT SWITCHES			
Rollers	-	Code 25-205	Lubricate sparingly every 3 mos. Keep oil from rubber.
Hinge and link pins	-		

TABLE 4-1
LUBRICATION

LUBRICATION POINT	FIG. REF.	LUBRICANT	NOTES
BUFFERS, CAR AND COUNTERWEIGHT	8-29	Code 40-170	Every 3 mos. check oil level and cleanliness. Refill to gauge level.
DOOR OPERATOR	8-21	Code 07-185	Check monthly; fill to oil level mark. Change oil every 2 years.
ROLLER GUIDES			
Wheel Bearings	8-19	Code 02-002	Check monthly Refill as necessary.
Sealed Bearing			Check monthly

SECTION V

TROUBLE SHOOTING

5-1. SAFETY PRECAUTIONS

5-2. Observe safety precautions at all times. Open power line when working in the pit or on top of the car. Note that control circuits operate on 450 volts; therefore, use extreme care in trouble shooting energized equipment.

5-3. PRELIMINARY VISUAL INSPECTION

5-4. Before applying power, inspect equipment for such visible indications of defective operation as:

a. Collection of dirt and gum on contactors and relays.

b. Excessive heating of parts as evidenced by charred insulation or odor.

c. Binding of moving parts.

d. Corrosion

e. Loose connections, worn or broken mechanical parts.

5-5. Check that the following control components are in the condition described below. Check continuity where necessary.

a. Car and hoistway doors are closed.

b. All emergency STOP switches are closed.

c. None of the safety limit switches has operated

d. INSPECTION switches are in normal position

e. None of the thermal overload relays has tripped.

5-6. TROUBLESHOOTING PROCEDURE

5-7. The troubleshooting procedure is given in Table 5-1. Voltage and resistance test points (i. e., C70, C32, HL1) given in the "Test Indication" column refer to terminal studs on the selector and controller. Numbers in parentheses in the "Remedy" column locate the referenced components on the system schematic diagram, Figure 8-54. When following the procedure in Table 5-1, a test lamp or volt-ohmmeter should be available.

5-8. Check switch sequence by manual operation of contactors and relays. Refer to the system schematic diagram in Section VIII and to the sequence of operation in Section III when troubleshooting by this technique. To prevent accidental starting of the elevator motor, insert insulating material between the main contacts of contactors, U, D, L and M.

TABLE 5-1.

TROUBLESHOOTING PROCEDURE

TROUBLE	TEST INDICATION	REMEDY
1a. Elevator will not run. Call registered but generator not running.	No voltage between terminals C1 and HL1.	Replace fuses 1, 2, 3, 4, (1, 2) Restore main line switch (1) to ON position.
	No voltage at C2	Restore overloads 1P, 2P, 3P (7)
	No voltage at C3	Restore keyswitch 1MGS (7) to START position.
	No voltage at C133	Pull STOP button 1ES2, 2ES2 (5) in car to normal position
1b. Elevator will not run. Call registered, generator running.	Potential switch C not energized.	Replace fuse 8 (10) Close knife switch KS1 (10) Close selector cutout switches COS and RCOS (10) Reset protective switch (limit, governor, or safety) per paragraph 2-44. Replace fuse 6 or 7 (10)
	Car doors closed. Direction switches UX, DX and HY not energized.	If no voltage at C32, reset or replace car or hoistway door contacts GS1 or DS (16). If no voltage at C33-C34, see "Advancer panel does not move out ahead of crosshead" below. If no voltage at C35-C36, clean, adjust or replace contacts of stop switches SS9-SS10 (16) on car.

TABLE 5-1.

TROUBLESHOOTING PROCEDURE

TROUBLE	TEST INDICATION	REMEDY
	Relays UX, DX, HX energized; U, D and H released.	Replace fuse 13 or 15 (11). Replace relay coils (13).
	Advancer panel does not move out ahead of crosshead. Relay RAC or FAC not energized. Pawl magnet not set.	Replace RAC or FAC coil (14). Clean and adjust pawl magnet.
	Advancer panel does not move out ahead of crosshead. Relay RAC or FAC energized. Voltage at advancer motor brush.	Replace brush motor. Clean and lubricate gear train if sticky.
2a. Car does not stop for any registered calls.	Pawl magnet does not reset.	Clean, adjust or replace selector rocking contact SRC (9). Clean, free of binds, lubricate pawl magnet core or pivots. Replace thyratron XHS (20).
2b. Car does not stop for registered hall calls. Stops for car calls.	Relay HJ not energized.	Replace thyratron XHJ (20) Clean, adjust, lubricate relay HJ (20).
2c. Car does not stop for registered car calls. Stops for hall calls.	Relay HG not energized.	Replace thyratron XHG (9) Clean, adjust or replace hook brush on floor bars. Clean, adjust, lubricate relay HG (9).

TABLE 5-1.

TROUBLESHOOTING PROCEDURE

TROUBLE	TEST INDICATION	REMEDY
3. Car missing stops.	Car stopping at the floor beyond call.	Clean, free of binds, lubricate pawl magnet (9).
	Car stopping at a floor beyond call. Stop is quite abrupt. Advancer panel does not return to crosshead after stop.	Replace RAC or FAC (7) coil if defective. Replace U1 or D1 rectifier (13) if defective. Clean, adjust or replace SLS contacts SLS7 or SLS8 (14).
4. Car running slow speed.	Speed switches 1E, 2E etc. released.	Replace relay coils of 1E, 2E (17), etc. Replace fuse 16 (17) Clean, adjust or replace contacts of slowdown switches SLS (17). Clean, adjust or replace contacts of car stopping switches SS (17).
5a. Car shoots through floor, stops beyond level position.	Relays UX, DX, HX, U, D and H do not release. LI or RLI does not release.	Clean, free binds, and lubricate selector leveling ring. Clean, adjust or replace LV contacts 3-4 (7) as necessary.

TABLE 5-1.

TROUBLESHOOTING PROCEDURE

	TROUBLE	TEST INDICATION	REMEDY
5b.	Car not leveling. Car stops when relays UX, DX and HX release.	Leveling ring does not drop.	Clean, free binds, and lubricate or replace leveling ring as required.
		No voltage at C13	Clean, adjust or replace INS contacts 11-12 (13).
		No voltage at leveling cam on selector.	Clean, adjust or replace LV contacts 1-2 (13).
5c.	Leveling at floor erratic.	Car overshoots floor, then relevels.	Check brake for binds, free and lubricate all pins.
6a.	Doors do not open.	Relays 1DO and 2DO released; voltage present at coil	Replace 1DO, 2DO coil (4). Clean, adjust or replace DZ1 or DZ2 contact on leveling ring (7).
		Relays 1DO and 2DO energized. No voltage on door motor armature at C98-C99.	Replace fuse 71 (1)
6b.	Doors do not close.	No voltage on door motor armature at C98-C99.	Replace fuse 71 or 73 (1).
		Relays 1DO and 2DO energized. Voltage at C129 or C174 (rear).	Adjust or replace safety shoe micro switch SGL (4).

TABLE 5-1.

TROUBLESHOOTING PROCEDURE

TROUBLE	TEST INDICATION	REMEDY
6c. Doors reopen when safety shoe retracts.	—	Adjust or replace safety shoe micro switch SGS (3).
6d. Doors do not hold open.	—	Replace capacitor XDO (3) with unit capable of providing sufficient time delay.
7. Magnetic safety shoe does not hold in retired position.	Safety shoe in lowered position during initial door open cycle.	Angle should contact magnet frame when door is in closed position. Replace SGM coil (4).
8a. Generators not shutting down on light traffic program.	Thyratron MGT not fired.	Replace MGT coil (21). Clean, adjust or replace GCR contacts 5-6 or CCX contacts 11-12. Check associated relay paths. Replace thyratron MGT (21).
	Thyratron MGT fired	Restore Program Selector keyswitch TPS (23) on control and communication panel to AUTOMATIC Restore NORMAL-CONTINUOUS keyswitch MGCS (21) on electronic and dispatching controller to NORMAL Clean, adjust or replace MGT contacts 1-4. Replace MGT coil if defective. Replace ETS coil (5) or contacts.

TABLE 5-1

TROUBLESHOOTING PROCEDURE

TROUBLE	TEST INDICATION	REMEDY
8b. Generators not starting up with continuous calls. Only one car running with numerous calls registered.	Thyratron CC not fired.	Replace thyratron CC (21). Clean, adjust or replace MGT contacts 3-4 (21). Replace MGT thyratron (21) Replace relay CC coil (21)
	Thyratron CC fired	Clean, adjust or replace CC contacts 3-4 (21) Replace CC relay coil.
9. Improper interval between dispatch of cars.	Either extremely long or extremely short interval.	Realign AUT panel per par. 6-50.
	No interval between dispatch of cars.	Replace triode; realign AUT and APS circuits. Reset potentionmeter P2 (24). Replace capacitor between points 3-12 (24).
	Extremely long interval between cars.	Replace AUT triode; realign AUT and APS circuits (24). Replace potentiometer P2 (24) Replace capacitor between points 3-12 (24).

TABLE 5-1

TROUBLESHOOTING PROCEDURE

TROUBLE	TEST INDICATION	REMEDY
10. Faulty car or hall button operation.	All touchbuttons lack sensitivity	Set power supply voltages per par. 6-60.
	All car (or hall) touch-button glow dimly.	Replace rectifier CRF (9) or HBRF (9).
	Individual touchbutton does not light.	Replace touchbutton tube; match numbers stamped at base of tube.
11. Hall lanterns and landing position indicators inoperative.	Individual units inoperative.	Replace bulbs (25, 26)
	All units inoperative.	Replace fuse 9
12. Position indicators do not show true position of car.		Adjust cams on selector panel for proper PIC toggle (26) throw Replace PIC switch (26) if toggle action faulty.

SECTION VI
OVERHAUL

6-1. SAFETY PRECAUTIONS

6-2. Observe safety precautions at all times. Open power line when inspection or maintenance requires personnel to be on top of car, in elevator pit, or working on main controller.

6-3. REPLACEMENT OF HOIST ROPES

6-4. PREPARATION

6-5. It is recommended that all ropes on an elevator be replaced at the same time, because if one becomes badly worn, it is an indication that all ropes have received appreciable wear. When reroping use 496 feet of prestressed 5/8-inch diameter 6 x 19 extra high strength steel ropes with fiber core and an ultimate strength of 31,600 pounds.

6-6. Uncoil or unwind new ropes carefully to avoid kinks which shorten rope life. Allow time for uncoiled rope to straighten itself out before using.

6-7. To equalize strain on rope strands and to prevent loss of rope lay, the ends of the rope should be seized before cutting. Four (4) seizings on each side of the point to be cut are required. Use .035" diameter annealed iron wire wound tight and even for seizing. Place twisted ends of seizing so that they fall in the valleys between strands and away from end of rope. Never use tape for seizing. Use at least 10 turns of wire per seizing, spaced as required by rope fitting.

6-8. PROCEDURE

6-9. With the car set at the top landing and counterweight resting on buffers, the recommended procedure for reroping is as follows:

a. Bring the coil or reel of new rope to the top landing.

b. Drop the end of a manila rope fall from the machine room level. Secure the hoisting rope end to it and haul it up and reeve the hoist rope over the secondary sheave and the driving sheave, then down to the counterweight.

Leaving enough slack rope for fastening to counterweight thimble rods, secure rope at counterweight.

c. Seize and cut rope at carframe end, being sure to deduct for length of thimble rod.

d. Turn the new rope into thimble rod (through the hole in the small end) a sufficient distance for manipulation. Socket rope per steps e through j.

e. Remove the first two seizings and spread rope strands.

f. Clean off the extending strands by washing with a non-inflammable solvent.

g. The strand ends should then be bent, turned in, and bunched closely together. The turned-in portion should have a length not less than 2-1/2 times the cable diameter. The core should be cut off even with the tops of the looped strands.

h. Pull rope back as far as possible so that strands rest in the basket with the third seizing partly projecting outside the small end of the socket.

i. Hold tension on the rope and hammer the socket to seat rope well. The socket is now ready for babbitting.

j. When pouring babbitt, hold the prepared rope end and socket in a vertical position. Tape or waste may be wound around the rope at the base of the socket to prevent the metal from seeping through, but must be removed after the babbitt has cooled. Use only pure babbitt, free of dross, heated to a temperature just sufficient to produce fluidity.

k. Install thimble rod into hitch plate using equalizing spring, keyed washer, and spring seat washer.

l. Repeat steps d through k for rope at counterweight end. Counterweight thimble rods are installed with keyed washer and dished washer.

m. Repeat above procedure for other ropes.

6-10. After all the ropes have been socketed and assembled in their respective hitches, carefully adjust rope tension so that each carries as nearly as possible an equal part of the total load. See paragraph 4-5.

6-11. ROLLER GUIDES AND RAILS

6-12. The roller guide stands (metal frame in which the rollers are mounted) are set to proper adjustment on installation and should not need further readjustment. Check pressure of tire against rail every 3 months. Spring pressure should be sufficient to hold tire against rail, but loose enough to permit turning an individual roller by hand.

6-13. If tire becomes worn, or develops a flat area, remove entire assembly (wheel, tire, and bearing) and replace with new roller assembly. Save old roller for factory rework.

6-14. Clean car and counterweight guide rails annually. One man operates car from top inspection buttons. The second man saturates a cloth with Otis Elevator Co. cleaning compound No. 2 (or Stoddard's Solvent) and holds it against the rail as the car is moved up.

6-15. REPLACEMENT OF GOVERNOR ROPES

NOTE

The governor is set for the required governor tripping speed at manufacture. Do not readjust in field.

6-16. When replacing rope, use 935 feet of 1/2-inch diameter 8 x 25 steel rope with an ultimate breaking strength of 14,500 pounds.

6-17. To replace rope proceed as follows:

a. Block tension sheave frame up as high as possible and remove damaged rope.

b. Seize and cut new rope to approximate length and socket one end.

c. Fasten the socketed end of the rope to the carframe hitch.

d. Reeve the rope up over governor sheave, down around tension frame sheave and up to carframe hitch. Mark and cut rope to exact length, socket and fasten to hitch.

e. Remove block under tension frame and return elevator to operation.

6-18. BRAKE ADJUSTMENT

6-19. Before starting to adjust the brake, always place the empty car at the top of the hoistway, with the counterweight landing on its buffers. Remove motor leads so that the brake can be operated without moving the car. Then, proceed as follows:

a. Clean all brake pins in shoes, levers and cores. Remove rust and lubricate with a light oil. Pins should fit snug; if they are tight, use fine emery paper. Be sure that pins are reassembled in their proper places, with cotter pins in place and opened.

b. See that the brake lining is free from oil, dirt and gum, and that the rivets are below the surface of the lining. If the lining is new, be sure that its surface conforms with the contour of the pulley.

c. See that cores are clean, and lubricate with powdered graphite.

d. Adjust the core movement so that the minimum clearance between shoes and pulley with the brake energized is approximately 0.006-inch, measured at the top corner of the lining. Adjust by means of the clevis bolt set screw, with the brake coil series resistance short circuited.

6-20. MAINTENANCE OF MOTOR

6-21. Successful operation of electric motors depends on keeping them clean and properly lubricated. Keep both interior and exterior free from dirt, oil and grease. Lubricate per Table 4-1.

6-22. BRUSH MAINTENANCE

6-23. BRUSH PRESSURE ADJUSTMENT. All brushes should wear at approximately the same rate. If one wears noticeably faster (or slower), the fault is either improper brush pressure or improper grade of brush material. Check brush pressure in the following manner:

a. Place a thin strip of paper between brush and commutator.

b. Fasten spring scale to the brush pigtail.

c. Carefully pull upward on the spring scale in a straight line parallel with brush movement, while gently pulling on the paper. When the paper is free to be pulled from beneath the brush, the spring scale should read as shown below. Adjust brush if necessary.

(1) Type 269HT Machine	3/4 to 1-1/8 lb.
(2) Type 5B Generator	3 to 4-1/2 lb.
(3) Type 73GX Exciter	1-1/2 to 1-3/4 lb.

6-24. BRUSH REPLACEMENT. All brushes should be replaced simultaneously. Use only an approved replacement. Be sure all brushes are constructed identically of the same grade material. Replace brushes using the following procedure:

a. Remove old brush, clean out brush holder.

b. Fit in new brush, ascertaining that it can slide up and down in holder. Brush that sticks in holder will not press firmly against commutator.

c. Tighten brush holder and stem. Adjust spring pressure to normal value.

d. Insert a piece of No. 2 sand paper, grit side up, between brush and commutator.

e. Sand brush until properly seated, as indicated by contact with entire face of the brush.

f. Repeat with No. 0000 sand paper.

g. Clean grit from motor; check brush pressure; ascertain that each brush is seated square on the commutator bar, bearing evenly.

6-25. COMMUTATOR MAINTENANCE.

6-26. PRECAUTIONS. A properly functioning commutator displays a uniformly polished surface of dark amber or chocolate color. If doubt exists as to commutator appearance, consult maintenance supervisor. In particular, avoid the following practices:

a. Do <u>not</u> clean with carbon tetrachloride. Material is toxic, particularly when heated.

b. Never use emery paper; emery dust can cause short circuits. Use only grade 00 sandpaper or finer if specifically directed by maintenance supervisor.

c. Grinding of the commutator or undercutting of mica insulation should be performed only by thoroughly experienced personnel. <u>Turning</u> of the commutator is a lathe operation that can only be done properly in the shop; never turn a commutator on the job.

6-27. MAINTENANCE PROCEDURES. Perform the following procedures:

a. Inspect commutator regularly to be sure that oil does not accumulate. Clean commutator regularly using a flat stick wrapped in approximately 16 layers of 6 to 8-ounce canvas.

b. If oil leakage is persistent, fault may lie with excessive oil in cup at end of motor or with use of incorrect lubricant. Check also that armature shaft is clean and well-polished; a smooth armature shaft retards the creepage of oil from bearing to commutator.

c. Clean grooves regularly with a stiff brush or a V-shaped scraper made for the purpose.

6-28. RELAY AND SWITCH ADJUSTMENTS

6-29. If relay coil should fail, loosen screws to remove armature retainer and armature. Remove and replace damaged coil, re-assemble switch and check to maintain proper air gaps.

6-30. TYPE 6164BP MAGNET SWITCHES

6-31. The armature air gap at the top of the core, with the coil de-energized, should be 11/64" and the air gap of the normally open contacts will be between 5/32" and 3/16". With the coil energized, armature closed, the air gap of the normally closed contacts will be between 5/32" and 3/16". This setting of the armature and contacts will provide proper wipe of silver-to-silver contacts.

6-32. If contacts are excessively worn or pitted, replace both movable and fixed contacts. When replacing the movable contacts, make sure that the short leaf springs are correctly positioned in relation to the springs to which the contacts are riveted.

6-33. TYPE 6520 MAGNET SWITCH

6-34. The armature air gap at the top of the core, with coil de-energized, should be 1-1/8"; with coil energized and contact just touching, the air gap should be 9/32". On the "L" switch (type 6520R), the breaking auxiliary contact airgap should be approximately 5/32"; the making contact armature airgap should be 3/8" with the contact just touching. On the "M" switch (type 6520T), the breaking contact airgap should be adjusted to 1/16"; the making contact is the same as on the "L" switch.

6-35. The main contacts are silver-tungsten carbide-to-silver-tungsten carbide. The auxiliary contacts are silver cadmium oxide-to-silver-to-silver cadmium oxide.

6-36. TYPE 6754 MAGNET SWITCHES

6-37. The armature air gap at the top of the core, with coil de-energized, should be 7/16" and the contact air gap of the normally open main contacts should be 1/2".

6-38. The contact air gap of all the normally open auxiliary contacts should be 1/4", except the air gap of the left hand normally closed auxiliary contact of type "C" switch should be 1/16". Adjust by bending contact springs towards the stationary contact.

6-39. The main contacts are carbon-to-copper and the auxiliary contacts are silver-to-silver. The position of the main fixed contacts (carbon) are adjustable for wear. Contacts should be replaced when they show excessive wear.

6-40. TYPE 6830 MAGNET SWITCHES

6-41. The armature air gap at the top of the core, with coil de-energized, should be 17/32" and the air gap of the main contacts should be 9/16". The air gap of the auxiliary breaking contacts should be approximately 5/16"; the armature air gap should be 5/32" with the making contacts just touching.

6-42. The main contacts are copper-to-carbon or silver cadmium oxide to-silver cadmium oxide. The auxiliary contacts are silver-to-silver. The position of the main fixed contacts (carbon or silver cadmium oxide) is adjustable for wear. Contacts should be replaced when they show excessive wear.

6-43. TYPE 6842B, 6842C AND 6842G RELAYS

6-44. Check the type 6842 relays listed below for contact air gap, pull-in voltage and pull-out voltage.

Relay	Contact Air Gap	Pull-In Voltage	Drop-out Voltage
DTR	3/64"	20V	10V
HCR	3/64"	Note 1	Note 1
LZC	3/64"	Note 2	Note 2
UT	3/64"	Note 3	Note 3
WLD	3/64"	20V	10V
XDP, XUP	3/64"	Note 3	Note 3

NOTES: 1. Pulls in when at least one hall call is registered; drops out after last hall call has been cancelled.

2. Pulls in when at least three low-zone down calls are registered; drops out when fewer than two low-zone down calls are registered.

3. See APS and AUT panel adjustment procedure.

6-45. If test results do not agree with values in preceding table, perform the following procedure:

a. Clean contacts with fine sandpaper.

b. Make sure that the movable make/break contact armature is straight and in line with the magnet armature. If not, carefully bend it straight.

c. Make sure that the stationary contact brackets are at right angles to the panel. If not, straighten bracket.

d. Check that auxiliary contact is straight and correct if required.

e. Back out the stationary breaking contact stud until it is just flush with its bracket.

f. Turn in the breaking contact stud three turns and tighten locknut.

g. Turn in the stationary making contact stud until it locks the movable contact to the stationary contact.

h. Back out the making contact one turn and tighten locknut.

i. Back out the stationary auxiliary making contact until, with the relay armature held tightly to the core, the auxiliary contacts just make.

j. Turn in the stationary auxiliary contact one turn and tighten locknut.

6-46. ADJUSTMENT OF TIMED RELAYS

6-47. The release of the relays listed in Table 6-1 is delayed by a capacitor and/or resistor in shunt with the coil. Before testing the dropout time of these relays, check relay mechanical operation.

6-48. To test relay dropout time:

a. Place 120 volts dc across relay coil circuit for a few seconds.

b. Remove 120 volts.

c. Use stopwatch to determine time elapsed until relay releases. This time should agree within 10% of value in Table 6-1.

TABLE 6-1

CAPACITOR-TIMED RELAY SETTINGS

SYMBOL	NAME	TIME (SECONDS)
ASR	Automatic Start Relay	1/2 - 1
BFR	Both Front and Rear	2
CC	Continuous Call	90 *
CCX	Auxiliary Continuous Call	1-2
CZ	Timed Aux. Potential Switch	3-4
CHS	Car Hall and Stop	Less than 1/2 *
2DO	2nd Door Open and Close	8-10
DGE, DGV	2nd Door (Up) Direction	7
DP, RDP	Door Protective	10-12
DR	Detent Release	20-30
DTR	Down Timing Relay	15
ETS	Excitation Time Switch	8-12
GDD	Group Down-Dispatching	1
H	Field and Brake Switch	1/2 - 1
HJX, RHJX	Aux. High Call Switch	2

TABLE 6-1

CAPACITOR-TIMED RELAY SETTINGS

SYMBOL	NAME	TIME (SECONDS)
ISX, ISY	Aux. High Call Switch	1/2 - 1
L	Star Switch	3-4
LAT	Leveling Approach Time	1/2 - 1
LWT	Load Weighing Time	1/2 - 1
LZC	Low-Zone Call	(Energize: 3 low-zone down calls (Drop Out: Less than 2 calls
MGT	Motor-Generator Time	2 minutes *
MGTX	Aux. Motor-Generator Time	1-2
NT	Car Time	1 and 4
NUS	No Up-Stop	8-10
PSX	Power Supply Test	3-4
1RL, 2RL	Releveling Excitation	2 **
SFR	Short Floor Relay	2
SG, RSG	Safety Shoe Switch	1/2 - 1
UT	Up Timing	See Par. 6-53
WLD	Group Cutout	50-60 *
XCS	Delayed Car Cutout	15-20
XDO, RXDO	M. G. Start and Door Open	3-4
XDP	Automatic Down Peak	See Par. 6-57
1XE to FXE	Speed Switch	1/2 - 1 **
XMC	Motor Field Switch	1/2 - 1
XUP	Automatic Up Peak	See Par. 6-57

* See Par. 6-51 for procedure
**Factory adjustment

6-49. If relay fails timing test, first readjust resistor. If no adjustable resistor is provided or if resistor readjustment does not bring dropout timing to value in Table 6-1, test capacitor and replace if defective. When several capacitors are paralleled, disconnect and test each individually.

6-50. DISPATCHING INTERVAL AND PEAK DETECTOR ADJUSTMENT

6-51. PRELIMINARY PROCEDURE

a. Jumper WLD contacts 5-6 to prevent cars moving on emergency car dispatch operation.

b. Place IND SERVICE-GROUP toggle switch in service cabinet portion of main car operating panel in IND SERVICE position.

NOTE

All cars must be prevented from moving while these adjustments are made.

6-52. TIMING OF WLD, CC AND MGT RELAYS

a. Block in HCS switch.

b. Insulate HCR 3-4 contact.

c. Insulate CC 3-4 contact.

d. Simultaneously, push in GCR and MGT for 3-5 seconds, then release and start timing.

e. Time WLD to drop in 50 to 60 seconds.

f. Time CC to pick up in 80 to 90 seconds.

g. Time MGT to pick up in approximately 2 minutes.

6-53. AUT PANEL TIMING

6-54. MINIMUM TIME ADJUSTMENT. Proceed as follows:

a. Insulate CCX 5-6 contact.

b. Jump out GUD 7-8 contact.

c. Turn potentionmeter P2 fully clockwise.

d. Jump CCX6 contact to GUD7 with a resistor (250 to 1000 ohms) for 5 seconds. Then, remove jumper to guard against damage due to a built-up charge on AUT capacitor 12-13.

e. Jump C181 to C201 (B).

f. Turn potentionmeter P3 counterclockwise until UT pulls in. Note this position and continue turning counterclockwise to a point halfway between the "pull in" point and the end of travel. This procedure may require readjustment of relay UT following instructions in paragraph 6-44.

g. Remove jumper from C181 to C201 (B).

h. UT switch should drop in 5 to 10 seconds. Adjust UT switch if necessary and then repeat steps e through g to check the time.

6-55. MAXIMUM TIME ADJUSTMENT. Proceed as follows:

a. Turn potentionmeter P2 fully counterclockwise.

b. Jump CCX6 to GUD7 for 5 seconds, then remove jumper.

c. Jump C181 to C201 (B).

d. After 3 to 5 seconds remove jumper used in step c. UT switch should drop in 45 to 60 seconds.

e. If necessary, adjust UT relay dropout time and reset the maximum time adjustment.

f. Reset potentionmeter P2 to three quarters of fully clockwise position.

6-56. INTERMITTENT OR UP-PEAK ADJUSTMENT. Proceed as follows:

a. Remove insulation from CCX 5-6 contact.

b. Set potentiometer P1 to center of travel.

c. Jump C181 to C201 (B).

d. Remove jumper used in step c after 3 seconds.

UT should drop after 20-30 seconds. Adjust P1 if necessary, turning clockwise to increase time.

e. Insulate CCX 5-6 and wait for about 2 minutes.

f. Jump C181 to C201 (B).

g. Remove jumper from step f after 3 seconds. UT dropout time should exceed 45 seconds. If it does not, UT capacitor should be replaced.

6-57. APS PANEL TIMING

6-58. This procedure requires a d-c power supply capable of variation from ± 40 to ± 120 volts and two 10,000-ohm, 25-watt (minimum values) voltage dividers to isolate the controller power supply from the external d-c power supply used for test purposes. Proceed as follows:

a. Turn off power. Connect one voltage divider between HL1 and terminal 6 of the AUT panel; negative test signals will be obtained from the center tap of this voltage divider. Connect the other voltage divider between HL1 and terminal 15 of the AUT panel; positive test signals will be obtained from the center tap of this voltage divider. Restore power.

b. Connect center tap of the "negative" voltage divider to terminal 12 of APS panel. Adjust power supply until -40 volts is read between center tap and HL1.

c. Relay XUP should not pull in, but if pushed by hand, it should stay in. Adjust if necessary.

d. Adjust power supply until -45 volts is read at top of "negative" voltage divider.

e. Relay XUP should now pull in. Adjust if necessary and recheck steps b and c.

f. Set 5-meg rheostat ("APS") to minimum resistance.

g. Re-adjust power supply (if changed) to -45 volts.

h. Remove test connection from terminal 12 of APS panel and, at the same time, start a stop watch.

i. Relay XUP should drop out in about 40 seconds. If time is less than 35 or more than 45 seconds, adjust pressure on making contact for desired timing. This adjustment will not affect pull-in voltage.

j. Connect tap on the "positive" voltage divider to terminal 12 of APS panel.

k. Adjust power supply until +40 volts is read at terminal 12 of APS panel.

l. Relay XDP should not pull in but if pushed in by hand, it should stay in. Adjust if necessary.

m. Increase voltage to +45 volts. XDP should now pull in. Adjust relay if necessary, then recheck steps j through l.

n. Remove test connection from terminal 12 of APS and start a stop watch.

o. Relay XDP should drop out in about 40 seconds. If time is less than 35 seconds or more than 45 seconds, adjust pressure on making contact for correct timing.

p. Adjust power supply for +84 volts at tap of "positive" voltage divider. Connect tap to terminal 14 of APS panel and, at the same time, start a stop-watch.

q. Relay XDP should pull in after approximately 50 seconds.

r. Remove test connection from terminal 14.

s. Adjust power supply for -84 volts at tap of "negative" voltage divider. Connect tap to terminal 14 of APS and, at the same time, start a watch.

t. Relay XUP should pull in after approximately 50 seconds.

u. Remove all test connections.

v. Set APS rheostat at approximately mid-travel for a relay pull-in of approximately 60 seconds.

w. The cars can now be put into operation.

6-59. TOUCHBUTTON POWER SUPPLY

6-60. POWER SUPPLY VOLTAGES

6-61. The following voltages should be measured with respect to BO1 unless

otherwise noted:

Test Point	Voltage
+ (R)	+ 135 vdc
LHR	65 vdc
B-	-30 to -40 vdc
B02	150 V
AC3 to HL1	115 vac
AC1 to B-	100 vac
1ERP	-45 vac

6-62. TOUCHBUTTON CIRCUITS

6-63. The forward resistance of the 866A rectifier tube will gradually increase as the tube ages. This reduction in the ability of the 866A tube to carry current will be indicated by a decrease in the glow of the associated touchbutton. When this is observed, the rectifier should be replaced.

6-64. When replacing touchbutton tubes, check number stamped on base of old tube and replace with new one with same number.

6-65. REPLACEMENT OF FUSES

6-66. Fuse ratings are tabulated below. All fuses are ferrule type. Fuses 51 through 58 are located in the Dispatching and Electronic Controller; all others are located in the Main Controller.

TABLE 6-2. FUSE RATINGS

Fuse No.	Voltage	Current	Fuse No.	Voltage	Current
1, 2, 3	600	10	55	250	6
4, 5	250	10	56	250	2
8, 9	250	3	57, 58	250	10
12	250	10	61, R61	250	1
13, 14	250	60	62, 63, 64	250	1
15	250	10	65, 66, R66	250	1
16, 17	250	3	71, R71	250	6
21, 22	250	1	72, R72	250	3
51, 52, 53	250	1	73, R73	250	6
54	250	3			

6-67. SELECTOR MAINTENANCE

6-68. REPLACEMENT OF SELECTOR TAPE

6-69. When removing the toothed tape that drives the front selector, leave a small piece at each end to serve as a guide in making the tape-to-car hitch. Replace with 956 feet of Otis type 297B1 toothed tape.

a. Using top inspection controls, run car until level with master floor.

b. Manually turn tape sheave on front selector until crosshead rises to master floor bar.

c. Set crosshead so that its pointer is centered on floor bar.

d. Loosen setscrew on tape sheave so that it turns independently of the selector shaft.

e. Using top-inspection controls, ride car to top of hoistway.

f. Connect tape to top-of-car hitch, then up and around the selector tape sheave.

g. Run car down to main floor, paying out selector tape.

h. Drop free end of selector tape into pit.

i. Thread tape around pit idler and up to hitch on safety plank beneath car platform. Make tape-to-car hitch, pulling all slack out to tape. (See Figure 8-42.) The adjusting nut on deadend hitch should be tightened until the washer on end of stud is against the pipe spacer, then the nut should be backed off until there is approximately 1/64" between washer and pipe. Pull down on tape until washer is forced away from pipe spacer, then release tape and note clearnace between washer and pipe spacer. Readjust, if necessary, until approximately 1/64" clearance remains.

j. Run car up and down hoistway several times to tighten tape; return car to master floor. Tighten setscrew on tape sheave.

k. Return car to normal operation. Travel to main floor, then return to master floor.

1. If car is not level with master floor, loosen or tighten adjusting nut on top-of-car tape hitch until leveling occurs. Readjust nut on tape hitch on safety plank per step i.

m. Lubricate tape lightly with bearing oil.

6-70. CROSSHEAD ASSEMBLY ADJUSTMENT

6-71. When the crosshead drive chain becomes loose due to stretch, the crosshead and leveling switch contact yoke drop out of synchronization with the floor bars and leveling cams. To take up slack on the chain, set car level at a floor and move the upper chain hitch lever on the crosshead panel until the panel is in line with the floor bar. Adjust upper chain hitch lever so that notch in center of leveling cam ("pie plate") is aligned with index mark on indicator A269AT2, Figure 8-41. Then tighten lower lever for proper chain tension.

6-72. SELECTOR READJUSTMENT AFTER RELOCATION OF REAR PLATFORM

6-73. When rear platform (s) is moved, the "rear" selector floor bar(s), leveling cam, and pawl magnet dogs must be reset in the following manner:

a. Using car inspection buttons, drive car until level with new platform setting. For this purpose, two men will be required— one in the car to observe whether car is level and one on top of car to operate inspection buttons. The key to accurate setting of the floor bar is stopping the car absolutely level with the platform.

b. On "rear" selector, set top of channel guide on advancer panel level with pointer on crosshead panel. Loosen floor bar for relocated platform and move until it is centered with pointers on crosshead panel.

c. Tighten floor bar.

d. Move "pie plate" (leveling cam) vertically along shaft until its top surface is flush (± .005) with top surface of indicator (A269AT2, Figure 8-41) on leveling ring.

e. If necessary, rotate "pie plate" until notch in center of cam surface is aligned with index mark on indicator A269AT2.

f. Advancer panel must be centered on crosshead panel as in step b above. Move pawl magnet dog 65BJ1 (item 20, Figure 8-39, sheet 2) until it is centered between lugs. Properly centered dog is shown in section FF of Figure 8-39.

6-74. Check connections to ASC floor bar contacts on front selector and to RASC contacts on rear selector.

a. ASC to be connected to terminal C245 if next landing above is at the rear and 33 inches or less below the next front landing.

b. ASC to be connected to terminal C247 if landing below is at the rear 33 inches or less away.

c. RASC to be connected to terminal C245 if landing above is at the front 33 inches or less away.

d. RASC to be connected to terminal C247 if landing below is at the front 33 inches or less away.

6-75. Disconnect XRC or RXRC contacts on any unused floor bars.

6-76. ADJUSTMENT OF LEVELING CONTACTS

6-77. PRELIMINARY PROCEDURE. Procedure given below must be performed separately for front and rear selectors. Proceed as follows:

a. Send car to master floor. Check that car is absolutely level, adjusting if necessary by means of inspection buttons.

b. Remove the bolts and flat-head machine screws (item 12, Figure 8-38, sheet 1) that fasten the sheave to the spider. Selector crosshead can now be raised or lowered without moving the car or the toothed tape.

c. Move crosshead, if necessary, until it is centered on master floor bar.

d. Camshaft dial at base of selector should read "O" and notch on leveling cam should be aligned with index mark. If necessary, readjust selector tape hitch for these conditions.

6-78. ADJUSTMENT PROCEDURE. In performing the following procedure, a voltmeter or bell and battery will be found useful in determining switch operating point.

a. When making replacement, install new LV contact on leveling ring in approximate location of old unit, then proceed as follows to make vernier adjustment of contact position.

b. Check that leveling ring moves up 3/16" when coil is energized. If necessary, adjust 1/4-20 hex nut (Figure 8-41) for this condition.

TABLE 6-3. LEVELING SWITCH SETTINGS

Contact	Type	Terminal Studs	Setting (Divisions)
LV3-4 RLV3-4	A6839G1	C1-C51 C1-C55	20.4
LV11-12 RLV11-12	A6839D2	C13-C19 C13-C71	10.5
DZ1-2 RDZ1-2	A6839E1	C1-C53 C1-C56	9.3
LV9-10 RLV9-10	6839D2	C13-C18 C13-C74	5.24
LV7 RLV7 LV8 RLV8	6839D2	C13-C17 C13-C89 C13-C14 C13-C145	1.46
LV5 RLV5 LV6 RLV6	6839D1	C13-C16 C13-C88 C13-C15 C13-C78	0.44

c. Move crosshead up until camshaft dial reads approximately 40.

d. Moving crosshead down, set LV contacts to break at camshaft dial readings given in Table 6-3. Use voltmeter or bell and battery placed across terminal studs given in Table.

e. To adjust operating point, move LV contact around leveling ring. Tighten LV contact when proper adjustment is achieved.

f. Move crosshead down until camshaft dial reads approximately 40.

g. Moving crosshead up, set remaining LV contacts to break at camshaft dial readings given in Table 6-3.

6-79. ADJUSTMENT OF SLOWDOWN AND STOP CONTROL CONTACTS.

6-80. PRELIMINARY PROCEDURE. Adjustment of slowdown (SLS) and stop control (SCC) contacts is best performed by two men- one at the selector in the machine room and one in the car. Procedure given must be performed for both front and rear selectors. Make all settings after approaching in the normal direction of travel (i.e., advancer panel moving up with up call registered, or down with down call registered); this precaution will reduce backlash. Finally, note that car remains stationary during this procedure.

a. Perform steps a through c given in Paragraph 6-77.

b. Disconnect a lead from elevator motor.

c. Disconnect a lead from brake coil.

d. Pull out fuse No. 14.

e. Set NORMAL-CONTINUOUS switch on controller to CONTINUOUS operation.

f. Turn GENERATOR STOP-START keyswitches on the control and communication panel and on the lobby control panel to START.

g. Close all safety contacts.

h. Close all hall and car doors.

i. In car, turn AUTO-ATT keyswitch to ATT, CAR TOP and SERVICE keyswitches to OFF.

6-81. ADJUSTMENT OF STOP CONTROL CONTACTS. The operating mechanism of stop control switch assembly, type 6851B (sheet 2, Figure 8-38) consists of two wing-like cams and a roller. "Wings" are adjusted by loosening the 8-32 round-head setscrew and rotating the cam. Roller position is adjustable along a horizontally oriented slot.

a. Set roller two-thirds of the distance from the right-hand end of the slot. Tighten securely.

b. Connect bell and battery across terminals C21-C23 (C21-C97).

c. Move selector carriage several floors above the master floor.

d. Momentarily press car button for master floor. Press and release down ("D") button. PM sets and brush advancer moves down.

e. Manually run down selector carriage until PM resets. Camshaft dial should read 364. If necessary, readjust stop collar which limits advancer panel movement.

f. Slowly run selector carriage down until bell rings, indicating that SCC (RSCC) contacts are closed. If necessary adjust upper wing until bell rings at 254 dial reading.

g. Move bell and battery to terminals C22-C23 (C22-C97).

h. Repeat for lower wing by running carriage several floors below the master floor, momentarily pressing master floor button and up ("U") button, then running carriage up until bell rings.

6-82. ADJUSTMENT OF SLOWDOWN CONTACTS. Slowdown contacts SLS1-SLS8 are located just above the advancer motor. Contacts are adjusted by loosening the Allen setscrews and rotating the phenolic cams. Prior to performing any adjustment or test, check that cam presses against contact throughout at least 180° of shaft rotation. Reset cams if necessary.

a. Move selector carriage several floors above master floor.

b. Momentarily press car master floor button and down ("D") button to set PM and move advancer panel.

TABLE 6-4. SLOWDOWN SWITCH SETTINGS

Contact	Measure Across Terminal Studs		Dial Setting	Notes
	+ Lead	- Lead		
SLS1) RSLS1)	C52	C103	179	Set SLS1 and RSLS1 at the same time.
SLS2) RSLS2)	C77	C104	129	Set SLS2 and RSLS2 at the same time.
SLS3) RSLS3)	C54	C105	91	Set SLS3 and RSLS3 at the same time.
SLS4) RSLS4)	C54	C106	59	Set SLS4 and RSLS4 at the same time.

TABLE 6-4. SLOWDOWN SWITCH SETTINGS

Contact	Measure Across Terminal Studs		Dial Setting	Notes
	+ Lead	- Lead		
SLS5) RSLS5)	C46	C107	35	Set SLS5 and RSLS5 at the same time.
SLS6)	C7	C8	28	—
RSLS6)	C7	C66		

c. Connect voltmeter between terminal studs C52 (positive lead) and C103, as indicated in Table 6-4.

d. Manually turning down selector, set SLS1 contacts to open at the value given in Table 6-4. Contact opening is indicated by fall in voltmeter reading.

e. After making any necessary adjustment, tighten SLS1 cam setscrews and proceed to test the other SLS contacts in the order given in Table 6-4.

f. Return selector carriage to master floor. Camshaft dial should read "O".

g. Reconnect tape sheave to spider.

h. Reconnect leads to elevator motor and brake

i. Re-insert fuse No. 14.

6-83. ADJUSTMENT OF LOAD-WEIGHING MICROSWITCHES

6-84. The nine load-weighing microswitches (1LW-9LW) are contained in a box mounted to brackets beneath the platform. (A tenth microswitch 10LW, is not used in this installation.) Each switch is set to operate with a given load in the car; operating point is set by adjusting the height of the micro-switch actuating stem. Switch operation is indicated by load test lights in the service cabinet portion of the main car operating panel.

6-85. Load-weighing microswitches are set at installation and should not require readjustment except following application of the car safety. To test and adjust circuit, perform the following procedure:

a. Gradually add weight to the car, starting with a line of test weights at each side of the platform, equally spaced front to back. Place successive loads alongside the first rows, but towards the center of the platform. When the last test load is added, the entire platform will be evenly covered with test weights.

b. Referring to table below, note load required to operate microswitches.

MICRO-SWITCH	TEST LOAD (POUNDS)	LOAD TEST LIGHTS ILLUMINATED	MICRO-SWITCH	TEST LOAD (POUNDS)	LOAD TEST LIGHTS ILLUMINATED
—	0	1, 4, 5	5LW	4800	2, 4
1LW	1000	1, 4	4LW	4800	(Relay NS releases)
2LW	1950	1	6LW	5800	2, 4, 5
3LW	2900	None	7LW	6800	2, 5
9LW	3900	2	8LW	8000	2, 3, 5

c. To readjust operating point, place proper load in car, looses locknut on microswitch and turn threaded actuating stem until microswitch is between operated and non-operated position. To check, push up on actuating stem and release; switch should click once, then remain in this position. Then, push down on actuating stem; switch should click again and remain in new position when pressure is released. If switch clicks when pressure on actuating stem is removed, it indicates need for readjustment of stem height.

6-86. ADJUSTMENT OF DOOR OPERATOR

6-87. Before adjusting, check lubrication of cams and linkages and oil level in door operator engine. Thereafter, coarse and fine adjustments can be made by setting the limit switches and rheostats, respectively, in the door operator control box.

NOTE

Door checks are set at installation and should not be re-adjusted.

6-88. LIMIT SWITCH SETTINGS

6-89. Check that each limit switch cam is centered on its contact to prevent interference with adjacent cams. Then, proceed as follows:

a. Set limit switches 01-05 as shown below while door is opening.

Limit Switch	Setting
01	Closes when door is 1-1/2" open.
02	Closes when door is 2" open.
03	Opens when door is 5" from fully open.
04	Opens when door is 1-1/2" from fully open.
05	Opens when door is 1-1/2" from fully open.

b. Set limit switches C1-C4 as shown below when door is closing:

Limit Switch	Setting
C4	Closes when door is 2-1/2" from fully closed.
C3	Opens when door is 2-1/2" from fully closed.
C1	Opens when door is 3/4" from fully closed.
C2	Closes when door is 3/4" from fully closed.
C5	Opens when door is 3/4" from fully closed.

6-90. RHEOSTAT SETTINGS

6-91. Set dial rheostats as described below, in the order given

Rheostat	Setting
06	Maximum opening speed (3.1 seconds)
01	Maximum initial opening speed, but quiet interlock operation
02	Maximum initial opening speed, but smooth transition to full speed
03	Slow door to prevent it from slamming open (set as close to full resistance as possible).
04	Minimum current to hold door open (set as close to full resistance as possible)
B1	Approximately 800 ohms
C2	Maximum closing speed (5.8 seconds)
C3	Slow door to forestall hand-pinching hazard
C4	Satisfactory nudging speed

6-92. HOISTWAY LIMIT SWITCHES

6-93. The location of hoistway limit switches at the upper and lower terminals is particularly important because they control the automatic stopping of the platform and prevent damage to the equipment which might be caused by excessive overtravel. The table below shows initial switch settings; actual setting will vary slightly due to individual differences between installations with respect to friction, etc. Distances shown in table are measured from car floor to terminal landing at instant switch opens.

Lower Terminal

1st Slowdown	SS1	9'-6" above landing
2nd Slowdown	SS7	8'-0" above landing
3rd Slowdown	SS5	4'-3" above landing
Stopping Contact	SS9	15" above landing
Final Limit	1LS	2'-1" below landing

Upper Terminal

1st Slowdown	SS2	9'-6" below landing
2nd Slowdown	SS8	8'-0" below landing
3rd Slowdown	SS6	4'-3" below landing
Stopping Contact	SS10	15" below landing
Final Limit	2LS	12" above landing

6-94. These switches are sufficiently lubricated during manufacture to last the expected life of the switch. Switches should not be opened unless trouble is suspected.

6-95. TRAVELING CABLE REPLACEMENT DATA

6-95. The 255-foot traveling cable consists of one 42-conductor and three 71-conductor cables. The 42-conductor cable consists of 24 unshielded #18 AWG conductors, 14 unshielded #14 AWG conductors, and two shielded telephone pairs. The 71-conductor cable consists of 71 unshielded #18 AWG conductors.

SECTION VII

TOOLS AND TEST EQUIPMENT

7-1. The following tools are supplied for each high-bay tower.

Item	Name	Quantity
1	Tool Cabinet	1
2	Pliers, Arc Joint	1
3	Pliers, Slip Joint	1
4	Wrench, Crescent (4 in., 8 in., 12 in.)	1 set
5	Wrench, Open End (3/8 in.)	1
6	Screwdriver, Standard (3 in., 4 in., 9 in.)	1 set
7	Screwdriver, Phillips-head (3 in.)	1

7-2. No special tools or test equipment are required.

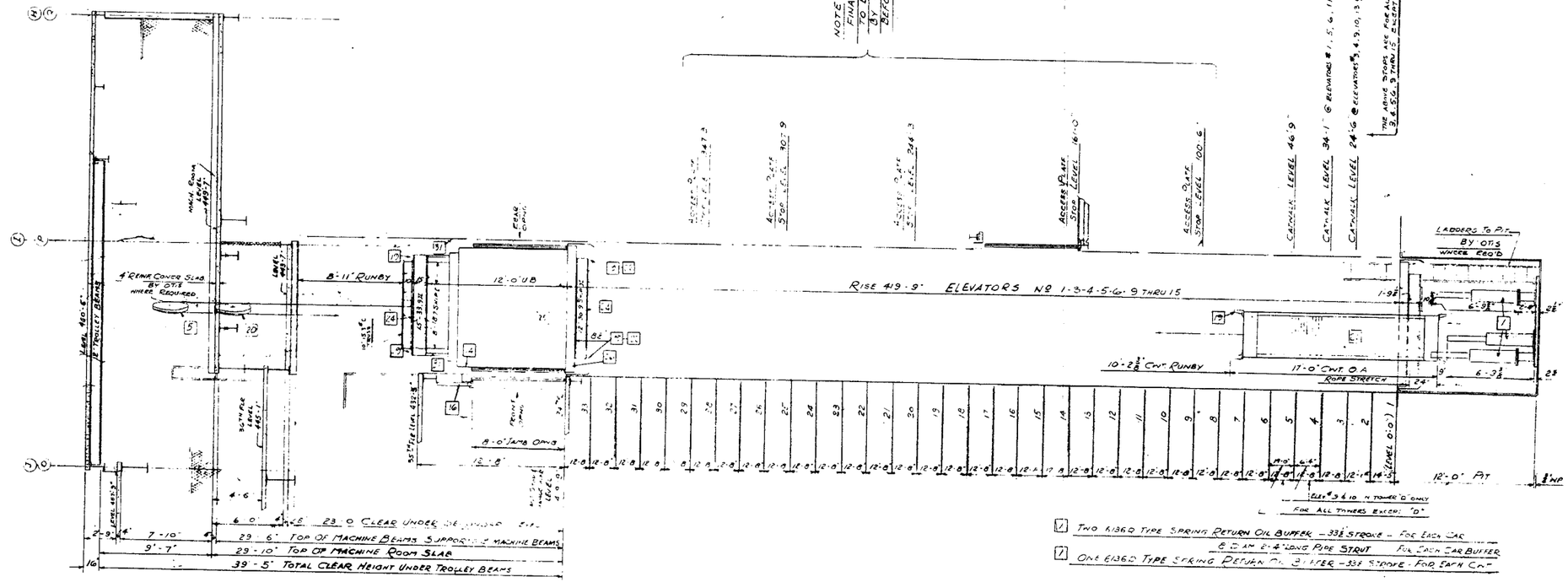
SECTION VIII

ILLUSTRATIONS

NOTE ALL ENTRANCES FRONT & REAR BY OTIS
SEE DWG "ZO-27117-932

32 FRONT OPNGS @ FIXED LANDINGS

FLOOR NO	LEVEL	TOWER 'A' CAR A	TOWER 'A' CAR B	TOWER 'B' 3	TOWER 'B' 4	TOWER 'B' 5	TOWER 'B' 6	TOWER 'C' 7	TOWER 'C' 8	TOWER 'D' 9	TOWER 'D' 10	TOWER 'E' 11	TOWER 'E' 12	TOWER 'E' 13	TOWER 'E' 14	TOWER 'F' 15	TOWER 'F' 16
		ELEV	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV
1	0'-0"																
2	14-5																
3	27-1																
4	39-1																
5	52-5																
6	65-1																
7	77-5																
8	90-1																
9	102-5																
10	115-9																
11	128-1																
12	141-3																
13	153-9																
14	166-5																
15	179-1																
16	191-9																
17	204-5																
18	217-1																
19	229-9																
20	242-5																
21	255-1																
22	267-9																
23	280-5																
24	293-1																
25	305-9																
26	318-5																
27	331-1																
28	343-9																
29	356-5																
30	369-1																
31	381-9																
32	394-5																
	14'-9"																
		17	6	6	6	6	6	7	7	8	8	8	8	8	8	8	8


NOTE: FINAL LEVELS TO BE CONFIRMED BY RESIDENT ENG BEFORE SETTING
ACCESS DOOR STOP LEVEL 341'-3
ACCESS DOOR STOP LEVEL 307'-9
ACCESS DOOR STOP LEVEL 244'-3
ACCESS DOOR STOP LEVEL 16'-0
ACCESS DOOR STOP LEVEL 100'-6
CATWALK LEVEL 46'-9"
CATWALK LEVEL 34'-1" @ ELEVATORS #1, 5, 6, 11, 12, 15, 16, TOWER B, E, F
CATWALK LEVEL 24'-6" @ ELEVATORS #3, 4, 9, 10, 13 & 14 TOWERS "B, D & E"
THE ABOVE STOPS ARE FOR ALL INSTALLED ELEVATORS NO. 1, 3, 4, 5, 6, 9 THRU 15 EXCEPT AS NOTED
LADDERS TO P.T. BY OTIS WHERE REQ'D
4" REINF. CONCR. SLAB BY OTIS WHERE REQUIRED.
LEVEL 460'-6" TO TROLLEY BEAMS
MACH. ROOM LEVEL 449'-3"
CEILING
8'-11" RUNBY
12'-0" UB
RISE 419'-9" ELEVATORS NO 1-3-4-5-6-9 THRU 15
10'-2 1/8" CWT. RUNBY
17'-0" CWT. O.A.
ROPE STRETCH
LEVEL 0'-0"
12'-0" AT 1 WP
8'-0" JAMB OPNG
SILL LEVEL 432'-8"
SILL LEVEL 445'-1"
4'-6
6'-0
6'-6 23'-0 CLEAR UNDER SHEAVES
7'-10"
9'-7"
29'-6" TOP OF MACHINE BEAMS SUPPORTING MACHINE BEAMS
29'-10" TOP OF MACHINE ROOM SLAB
39'-5" TOTAL CLEAR HEIGHT UNDER TROLLEY BEAMS
ELEV'S 3 & 10 IN TOWER 'D' ONLY
FOR ALL TOWERS EXCEPT "D"

[7] TWO 6136D TYPE SPRING RETURN OIL BUFFER – 33⅜" STROKE – FOR EACH CAR
8" DIAM. 2'-4" LONG PIPE STRUT FOR EACH CAR BUFFER
[7] ONE 6136D TYPE SPRING RETURN OIL BUFFER – 33⅜" STROKE – FOR EACH CWT.

32 REAR OPNGS @ ADJUSTABLE ASSY. PLATFORMS & FIXED CATWALKS

LEVELS	TOWER 'A' CAR A	TOWER 'A' CAR B	TOWER 'B' 3	TOWER 'B' 4	TOWER 'B' 5	TOWER 'B' 6	TOWER 'C' 7	TOWER 'C' 8	TOWER 'D' 9	TOWER 'D' 10	TOWER 'E' 11	TOWER 'E' 12	TOWER 'E' 13	TOWER 'E' 14	TOWER 'F' 15	TOWER 'F' 16*
	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV	REAR ELEV
0 3"																
24'-6"													F			
34'-1"																
46'-9"																
100'-6"																
[illegible]																
[illegible]																
[illegible]																
TOTALS	8 8		4	8	3	3	7	7	8	8	8	8	8	8	8	8

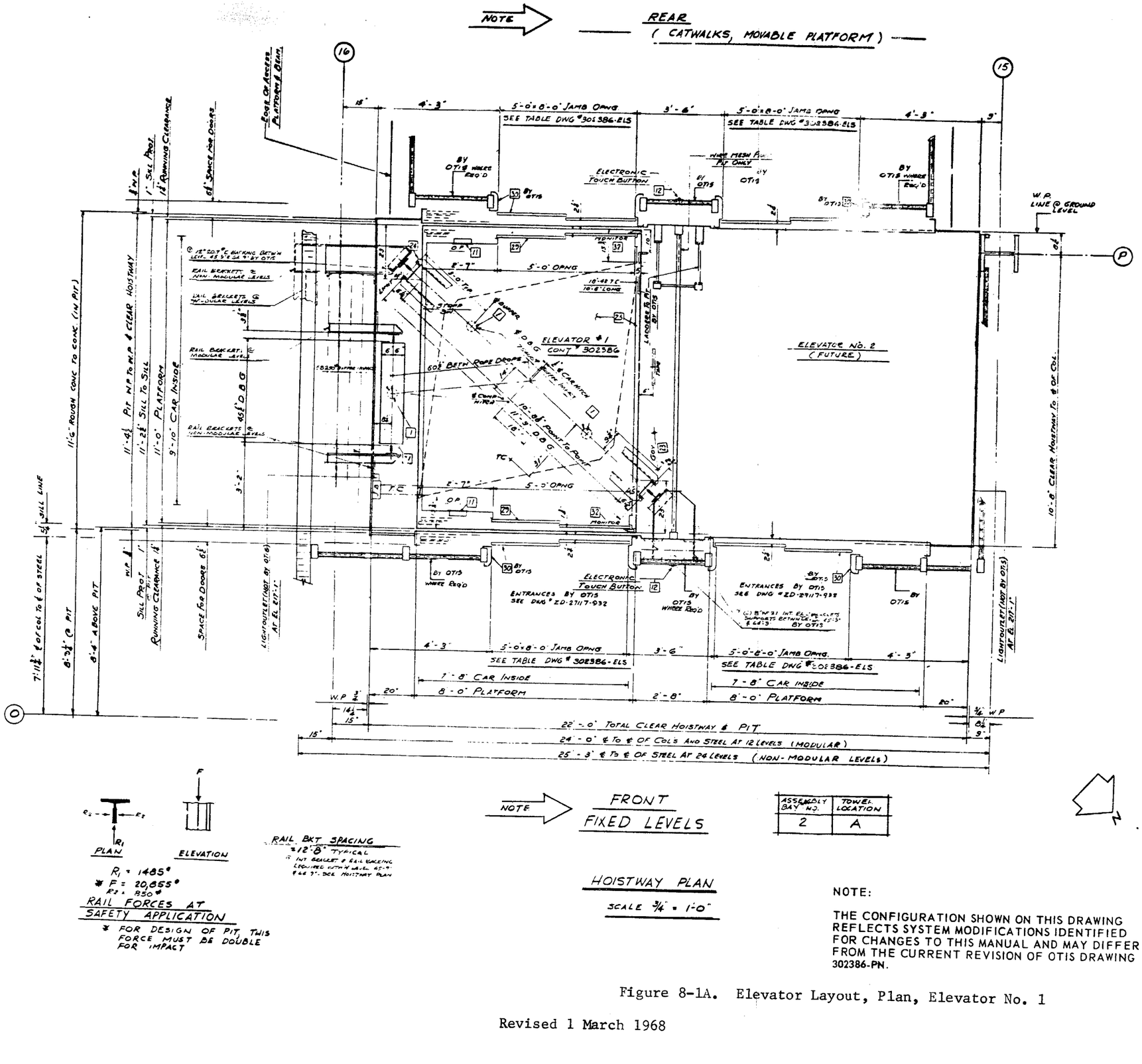
FIXED
CAT-WALKS (FIXED)
ADJUSTABLE
367 R.H. & THRU

* NO ELEVATOR – BOLTED DOORS

NOTE

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 302386-ELS

Figure 8-1. Elevator Layout, Sectional Elevations

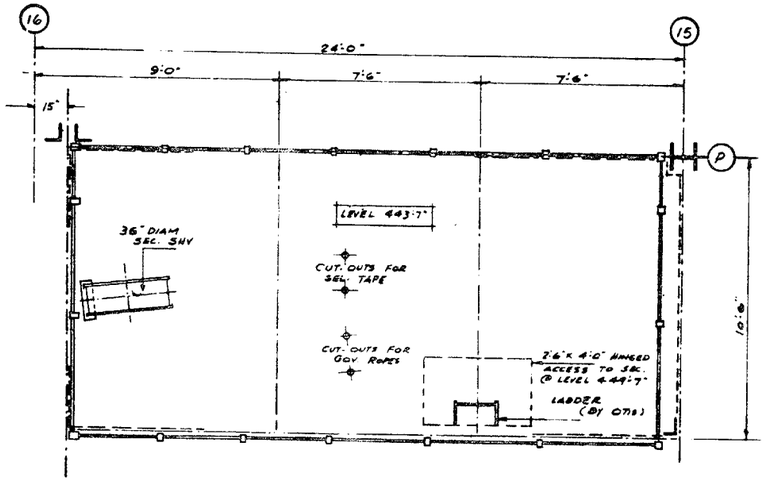


NOTE:

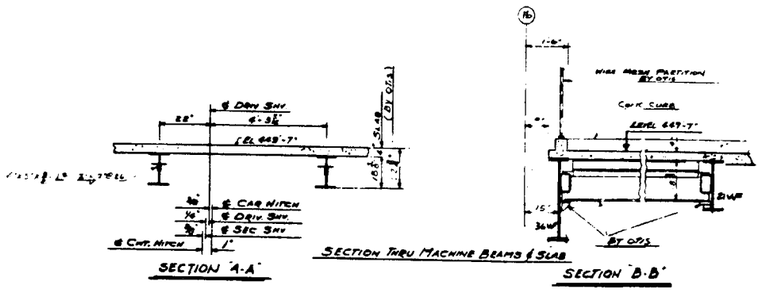
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 302386-PN.

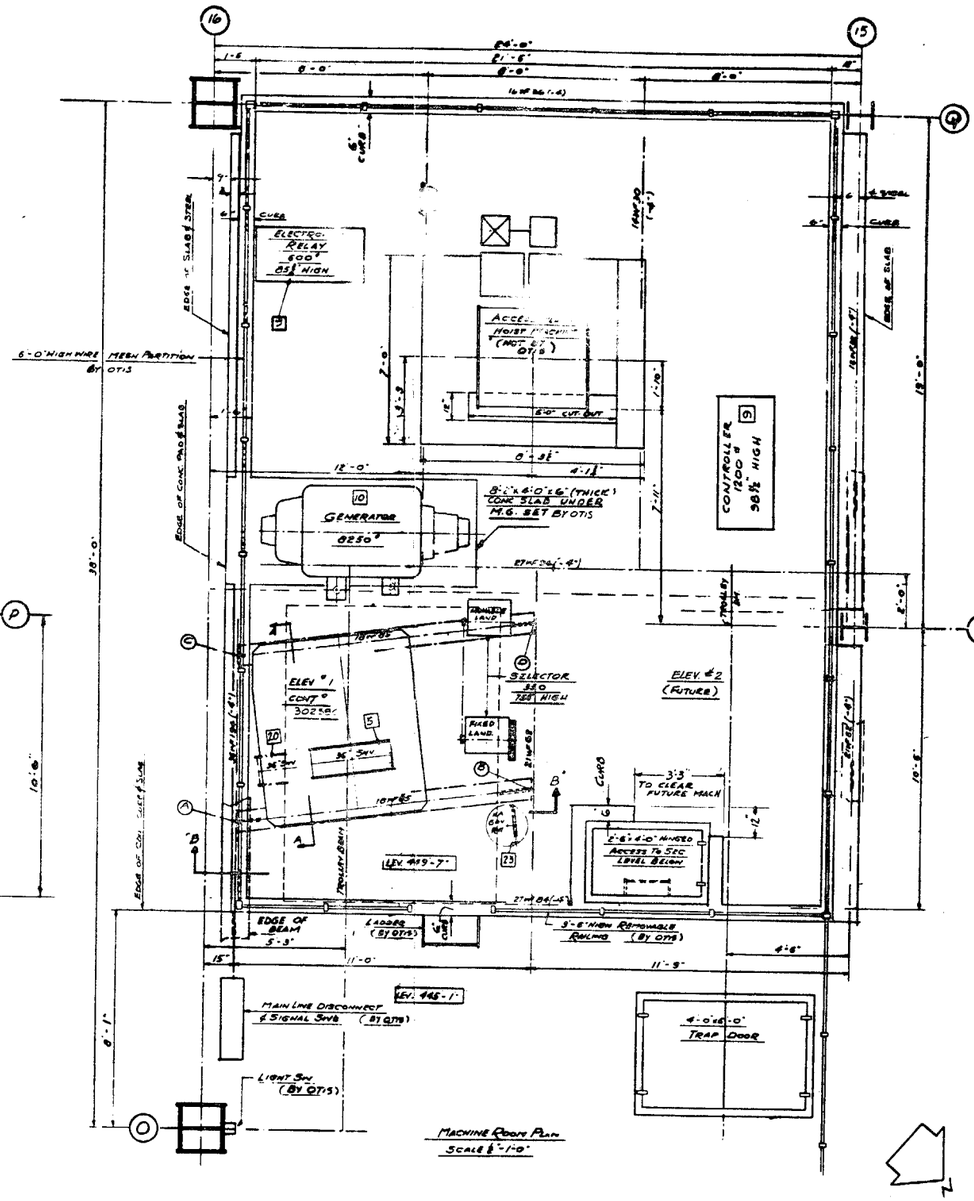
Figure 8-1A. Elevator Layout, Plan, Elevator No. 1

Revised 1 March 1968



LEVEL 443'-7"
SECONDARY LEVEL
SCALE 1/2" = 1'-0"





Machine Room Plan
SCALE 1/2"-1'-0"

REACTIONS			
A	41200#	B	28160#
C	23000#	D	11760#

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 302386-MR.

Figure 8-1B. Machine Room Layout, Elevator No. 1

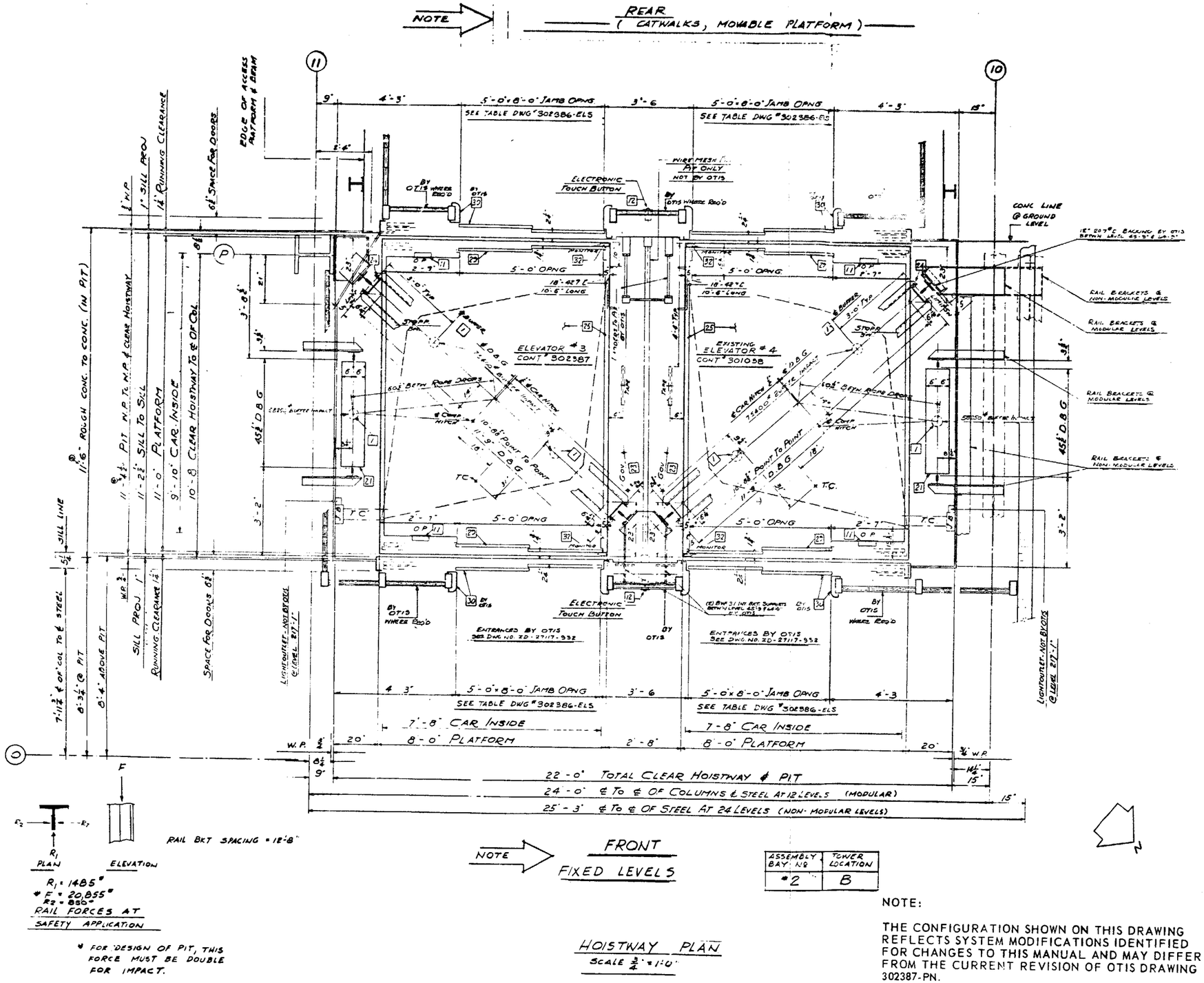
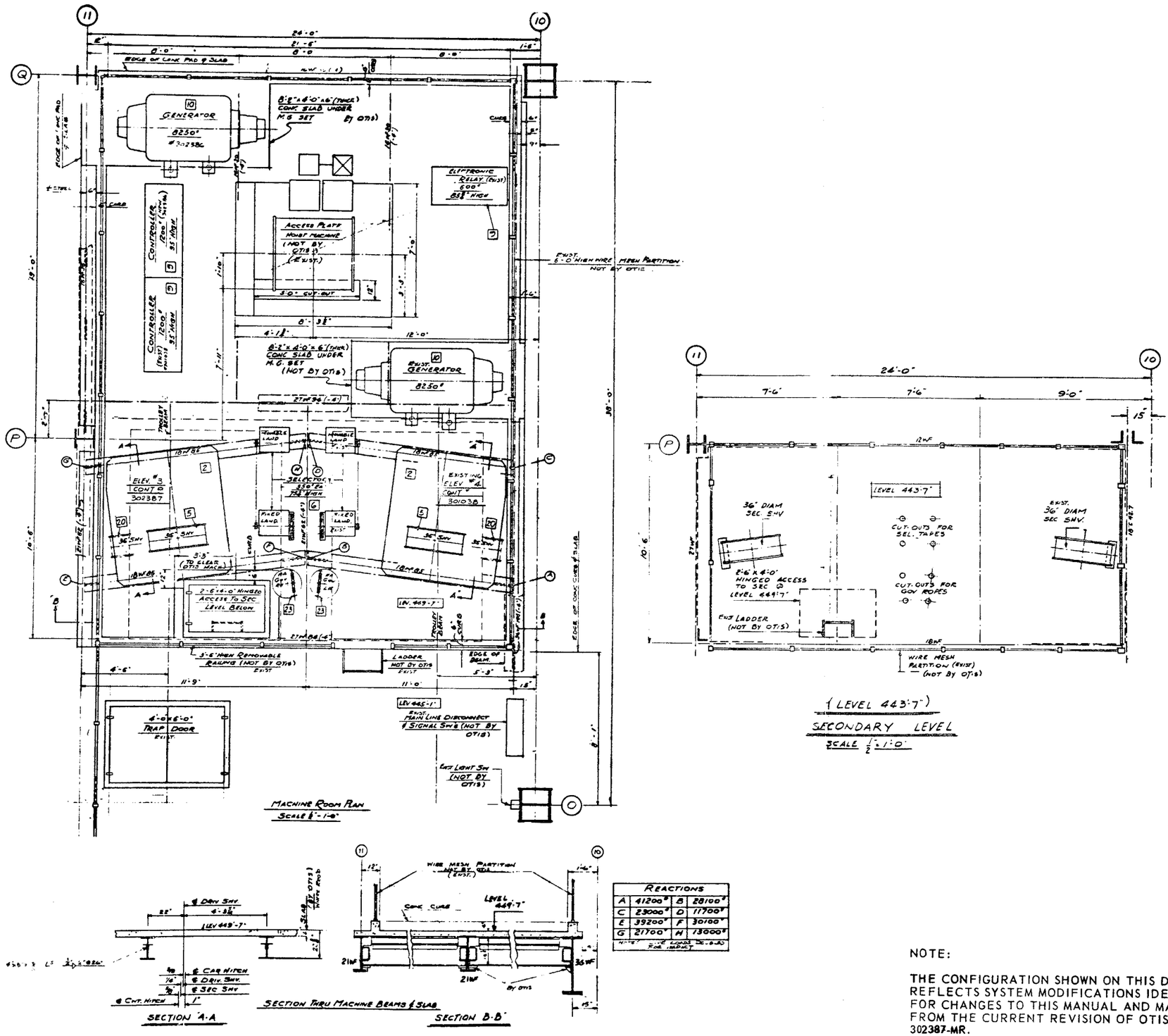


Figure 8-2. Elevator Layout, Plan View, Elevators No. 3 and 4

Revised 1 March 1968

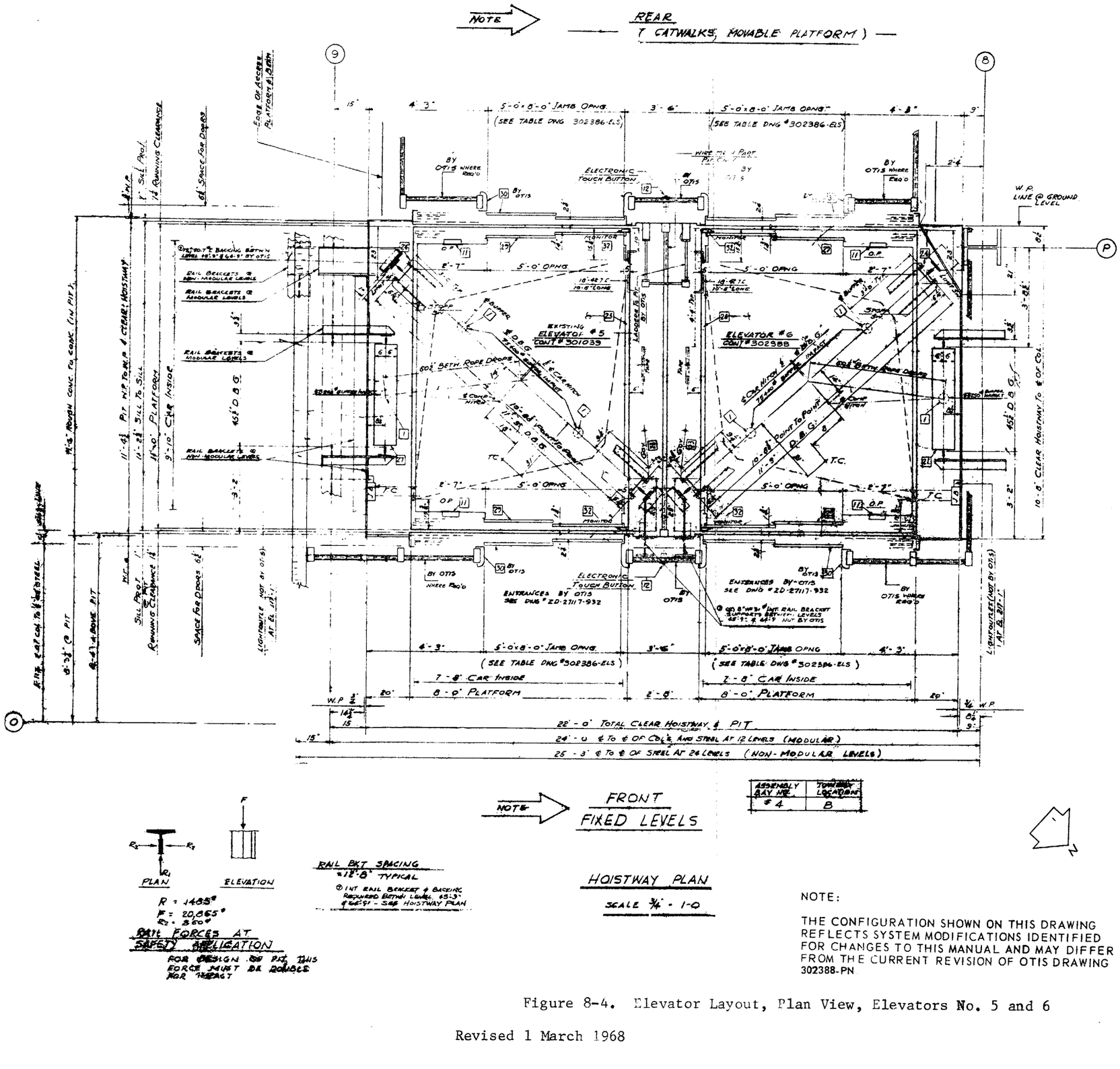

GENERATOR
8250#
#302386
CONTROLLER
CONTROLLER
ELECTRONIC RELAY (DUST) 600# 85" HIGH
ACCESS PLATE HOIST MACHINE (NOT BY OTIS) (EXIST.)
EXIST. 6'-0" HIGH WIRE MESH PARTITION NOT BY OTIS
EXIST GENERATOR 8250#
ELEV #3 CONT # 302387
EXISTING ELEV #4 CONT # 301038
SELECTOR
2'-6"x6'-0" HINGED ACCESS TO SEC LEVEL 863.0N
3'-6" HIGH REMOVABLE RAILING (NOT BY OTIS) EXIST
LADDER NOT BY OTIS EXIST
4'-0"x6'-0" TRAP DOOR EXIST
EXIST MAIN LINE DISCONNECT & SIGNAL SWS (NOT BY OTIS)
EXIT LIGHT SW (NOT BY OTIS)
EDGE OF CONC PAD & SLAB
EDGE OF CONC SLAB & PLATE
EDGE OF BEAM
LEV 449'-7"
LEV 445'-1"
TO CLEAR OTIS MACH
MACHINE ROOM PLAN
SCALE 1/2"-1'-0"
SECTION A-A
SECTION THRU MACHINE BEAMS & SLAB
SECTION B-B
WIRE MESH PARTITION (NOT BY OTIS) (EXIST.)
SONIC CURB
LEVEL 449'-7"
REACTIONS
A 41200# B 28100#
C 23000# D 11700#
E 39200# F 30100#
G 21700# H 13000#
FOR IMPACT
LEVEL 443'-7"
36" DIAM SEC SHV
CUT OUTS FOR SEL. TAPES
CUT OUTS FOR GOV ROPES
EXIST. 36" DIAM SEC SHV.
2'-6"x4'-0" HINGED ACCESS TO SEC @ LEVEL 444'-7"
EXIT LADDER (NOT BY OTIS)
WIRE MESH PARTITION (EXIST) (NOT BY OTIS)
(LEVEL 443'-7")
SECONDARY LEVEL
SCALE 1/2"-1'-0"
N

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 302387-MR.

Figure 8-3. Machine Room Layout, Elevators No. 3 and 4

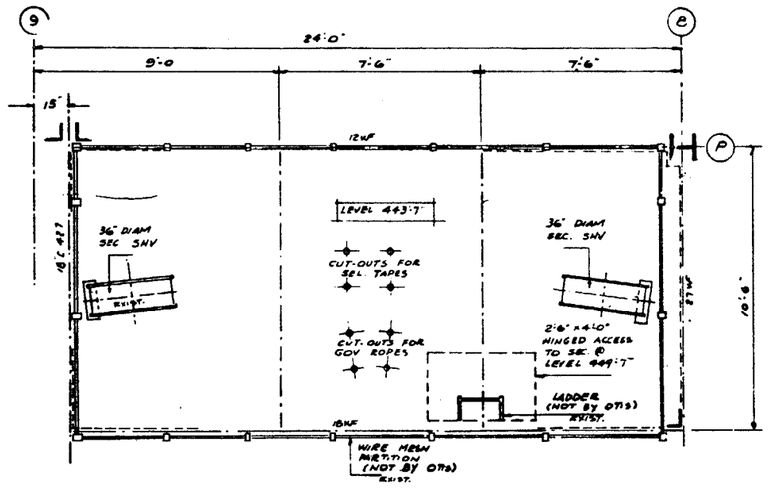
Revised 1 March 1968



NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 302388-PN

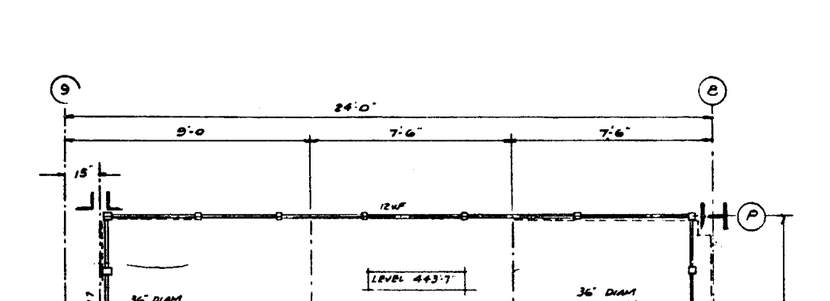
Figure 8-4. Elevator Layout, Plan View, Elevators No. 5 and 6

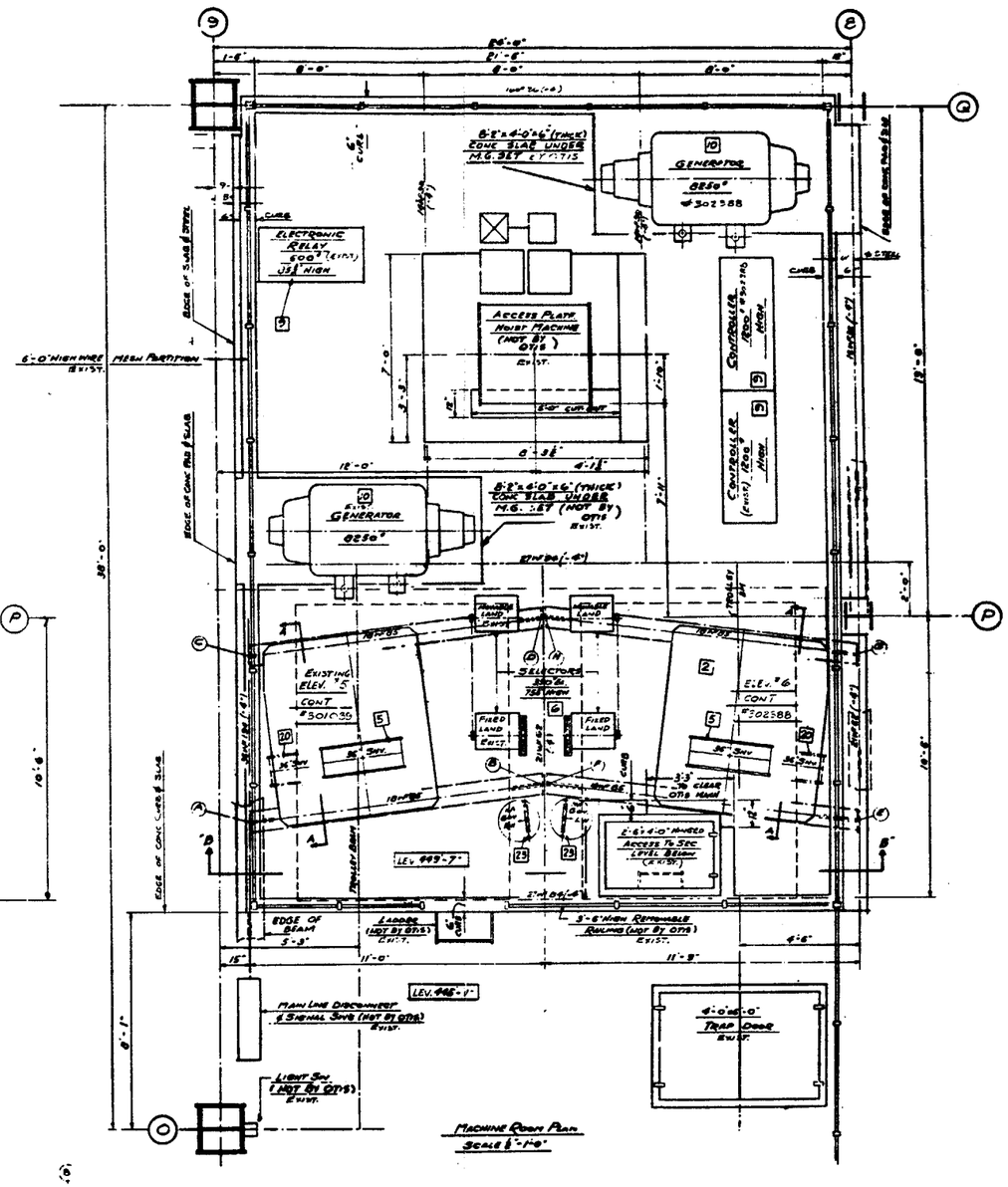


(LEVEL 443'-7")

SECONDARY LEVEL

SCALE $\frac{1}{2}$"=1'-0"





REACTIONS			
A	41200#	B	28100#
C	29000#	D	11700#
E	33200#	F	30100#
G	21700#	H	13000#

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 302388-MR.

Figure 8-5. Machine Room Layout, Elevators No. 5 and 6

Revised 1 March 1968

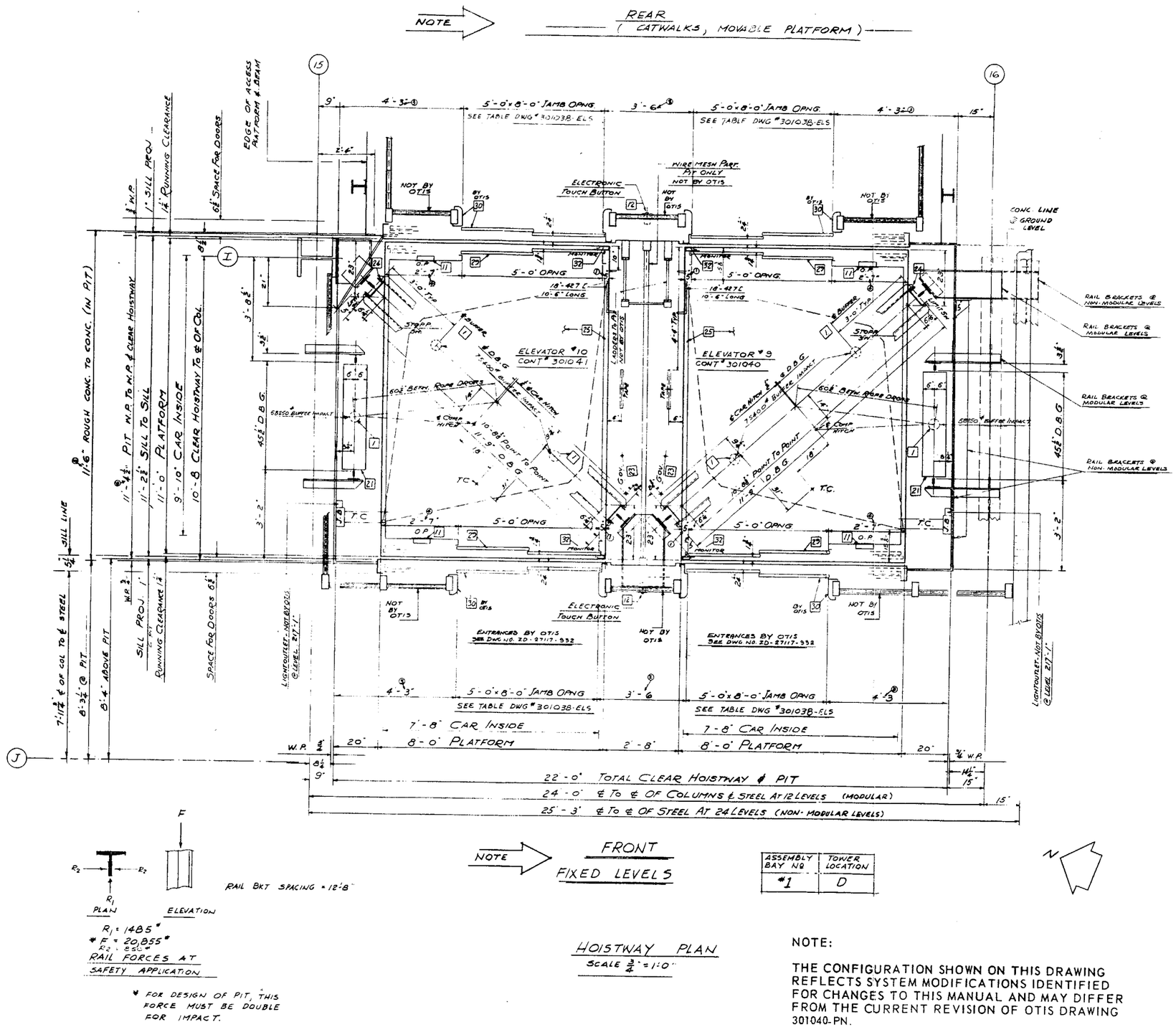
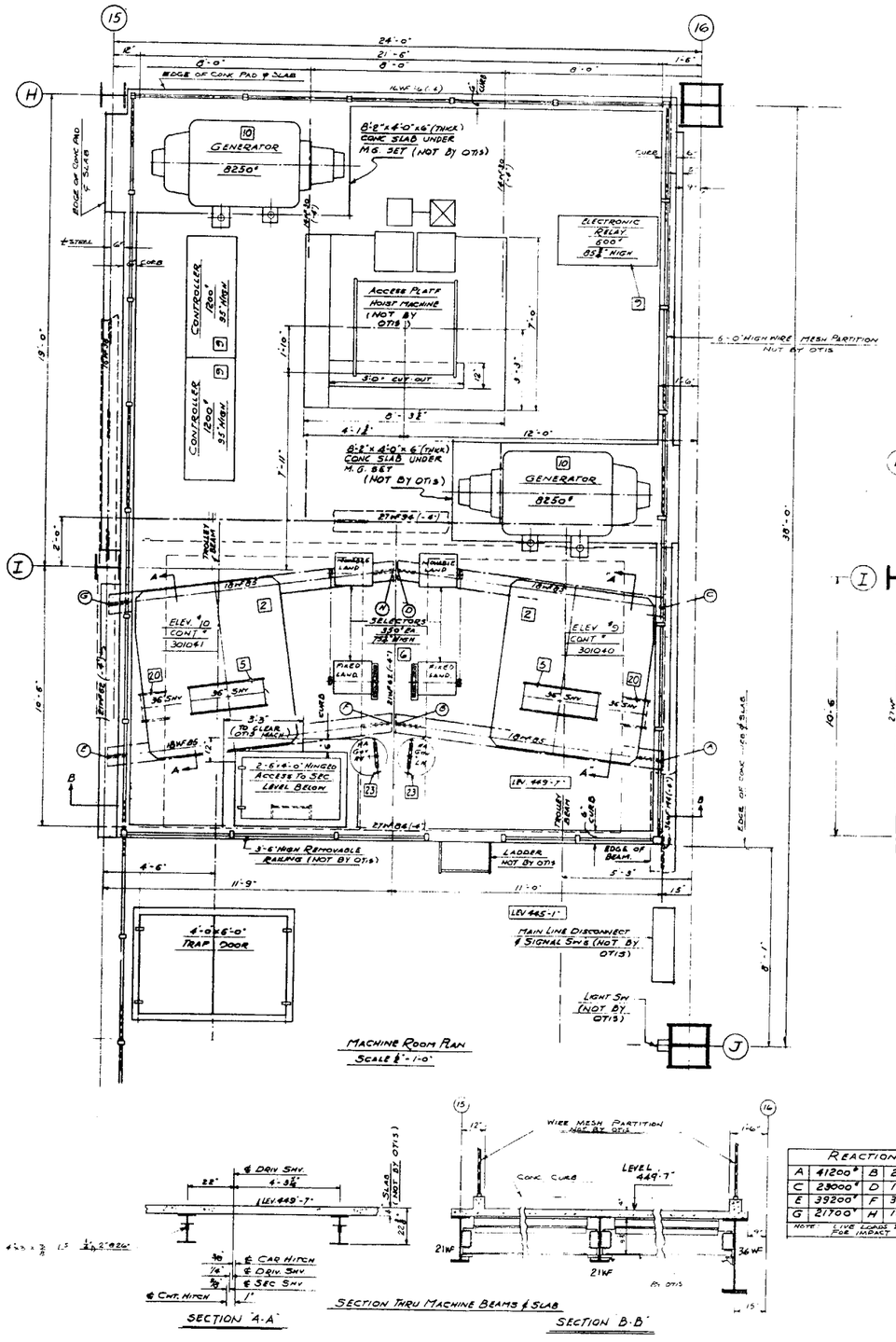


Figure 8-6. Elevator Layout, Plan View, Elevators No. 9 and 10



REACTIONS			
A	41200#	B	28100#
C	23000#	D	11700#
E	39200#	F	30100#
G	21700#	H	13000#

NOTE: LIVE LOADS INCLUDE 100% FOR IMPACT

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301040-MR.

Figure 8-7. Machine Room Layout, Elevators No. 9 and 10

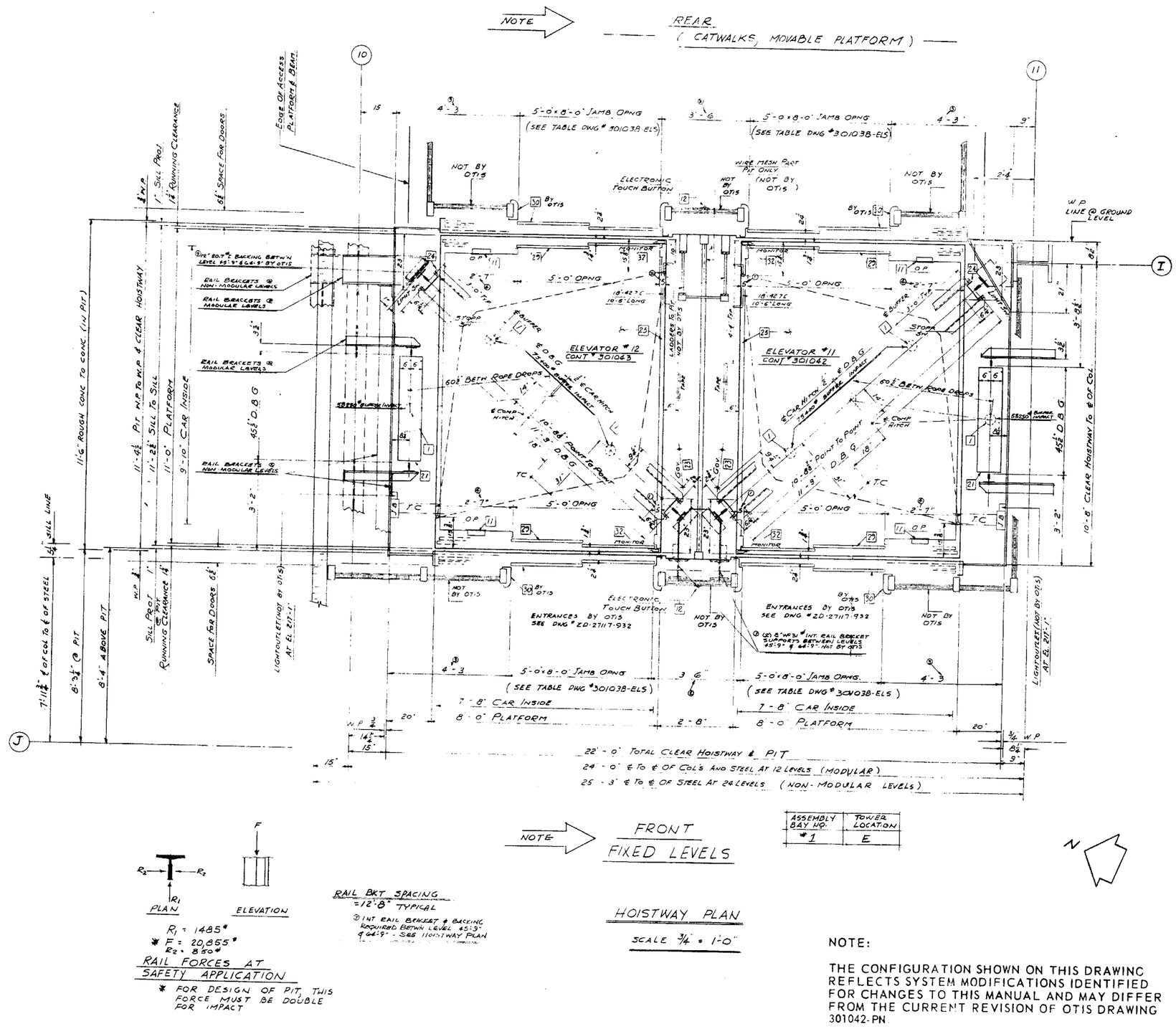
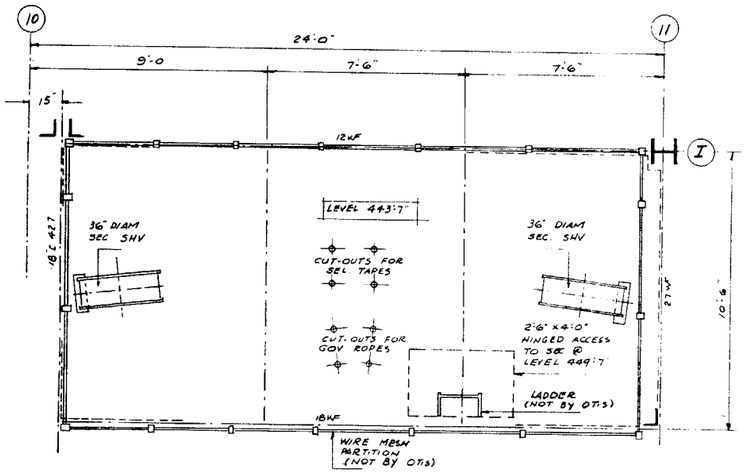


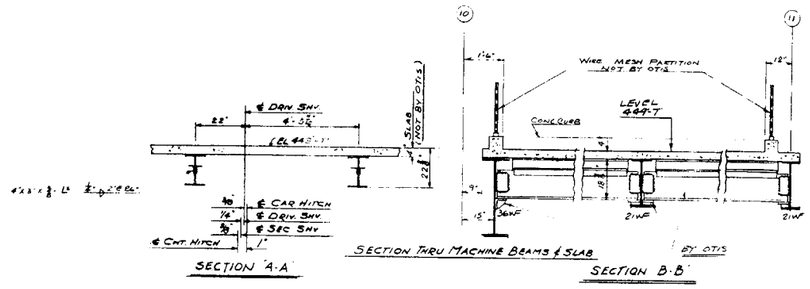
Figure 8-8. Elevator Layout, Plan View, Elevators No. 11 and 12

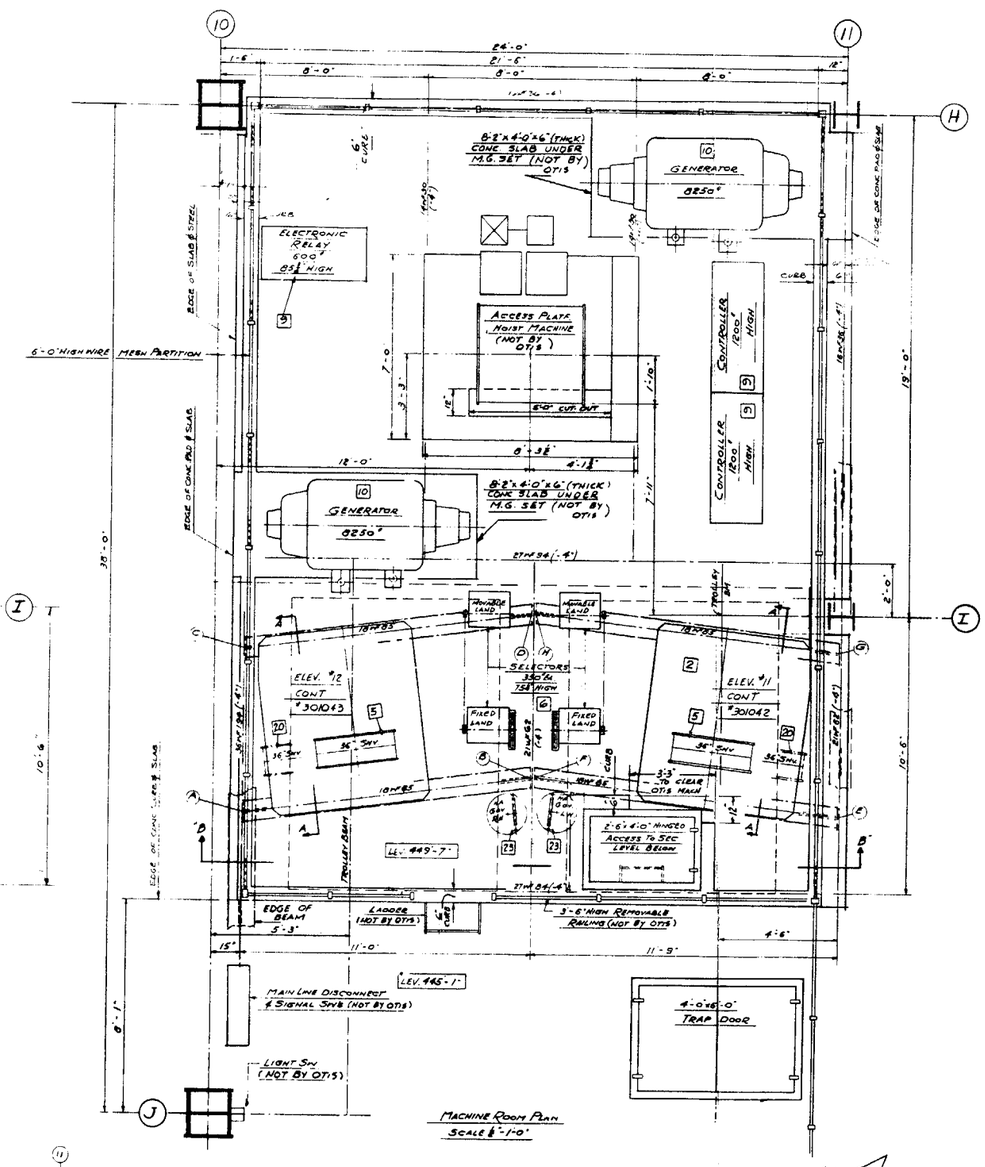


(LEVEL 443'-7")

SECONDARY LEVEL

SCALE 1/2 "=1'-0"





MACHINE ROOM PLAN

SCALE 1/2"-1'-0"

REACTIONS			
A	41200#	B	28100#
C	23000#	D	11700#
E	39200#	F	30100#
G	21700#	H	13000#

NOTE: LIVE LOADS DOUBLED FOR IMPACT

NOTE

1: PLAN VIEW SEE DWG # 301042-PN

2: SECTIONAL ELEVATION SEE DWG # 301038 ELS

3: REFERENCE DATA DWG (MR) SEE DWG # 301038-RD

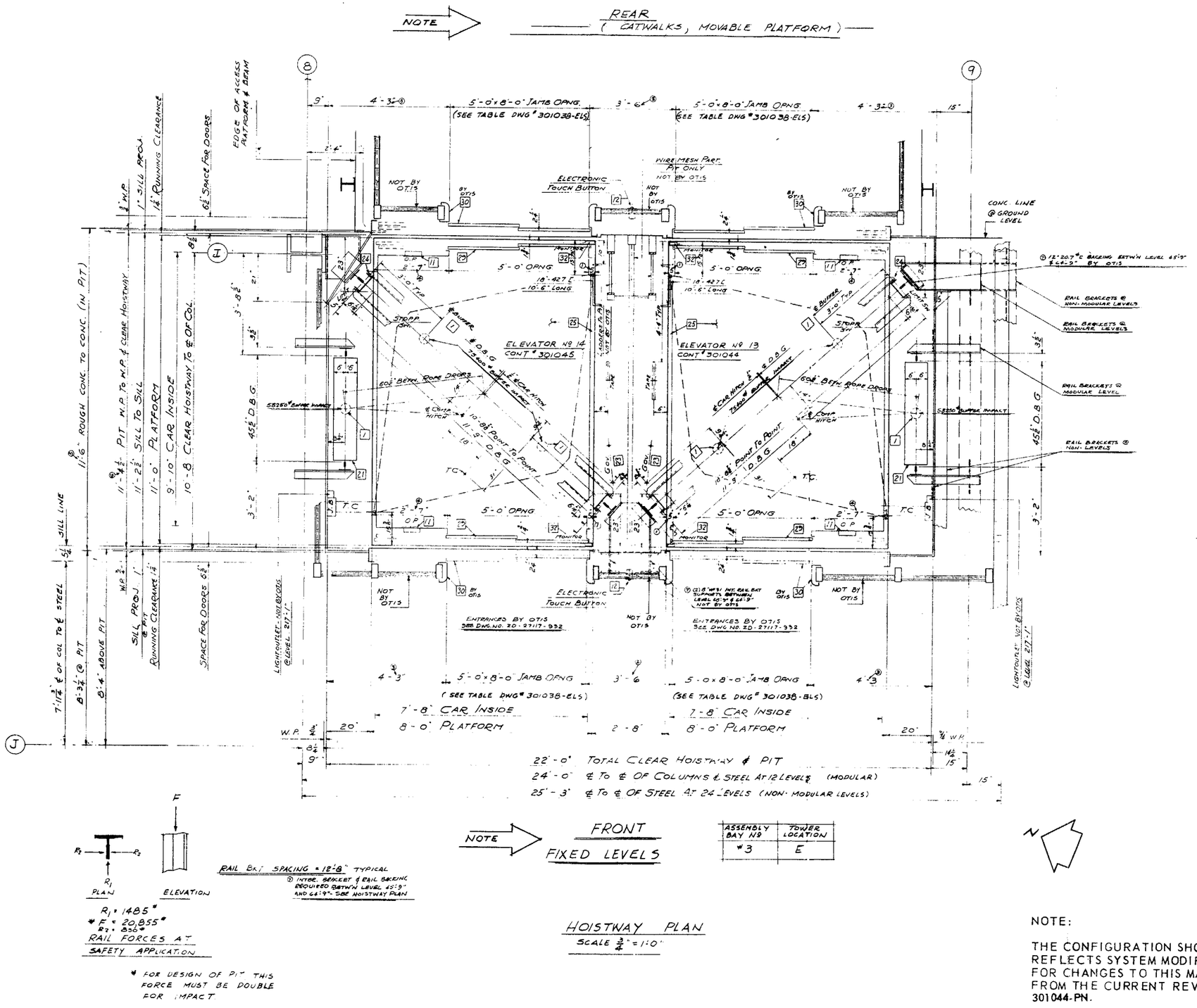
4: MACHINE ROOM SEE DWG

ELEVATOR #4 - 301038-MR
#5 - 301039-MR
9&10 - 301040-MR
13&14 - 301044-MR
#15 - 301046-MR

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301042-MR.

Figure 8-9. Machine Room Layout, Elevators No. 11 and 12


NOTE
REAR
(CATWALKS, MOVABLE PLATFORM)
8
9
I
J
5'-0" x 8'-0" JAMB OPNG. (SEE TABLE DWG # 301038-ELS)
ELECTRONIC TOUCH BUTTON
WIRE MESH PART BY ONLY NOT BY OTIS
NOT BY OTIS
BY OTIS
ELEVATOR NO 14 CONT # 301045
ELEVATOR NO 13 CONT # 301044
5'-0" OPNG
60" BETH. ROPE DROPS
STOPP SW.
CONC. LINE @ GROUND LEVEL
RAIL BRACKETS @ NON-MODULAR LEVELS
RAIL BRACKETS @ MODULAR LEVELS
RAIL BRACKETS @ NON-LEVELS
11'-6" ROUGH CONC. TO CONC. (IN PIT)
PIT W.P. TO W.P. @ CLEAR HOISTWAY
SILL TO SILL
CAR INSIDE PLATFORM
CLEAR HOISTWAY TO ℄ OF COL.
SILL LINE
℄ OF COL TO ℄ STEEL
ABOVE PIT
SILL PROJ.
RUNNING CLEARANCE
SPACE FOR DOORS
EDGE OF ACCESS PLATFORM & BEAM
7'-8" CAR INSIDE
8'-0" PLATFORM
22'-0" TOTAL CLEAR HOISTWAY & PIT
24'-0" ℄ TO ℄ OF COLUMNS & STEEL AT 12 LEVELS (MODULAR)
25'-3" ℄ TO ℄ OF STEEL AT 24 LEVELS (NON-MODULAR LEVELS)
LIGHT OUTLET - NOT BY OTIS @ LEVEL 217-1"
ENTRANCES BY OTIS SEE DWG. NO. ZD-27117-932

NOTE:
1: HOISTWAY PLAN - SEE DWGS #
ELEVATOR #4 - 301038-PN
#5 - 301039-PN
#9 & 10 - 301040-PN
#11 & 12 - 301042-PN
15 - 301046-PN
2: MACHINE ROOM SEE DWG # 301044-MR
3: SECTIONAL ELEVATION SEE DWG # 301038-ELS
4: REFERENCE DATA DWG (AB) SEE DWG # 301038-RD

F
R_2
R_1
PLAN
ELEVATION
R_1 = 1485 #
F = 20,855 #
R_2 = 836 #
RAIL FORCES AT SAFETY APPLICATION
FOR DESIGN OF PIT THIS FORCE MUST BE DOUBLE FOR IMPACT

RAIL EXT. SPACING = 18'-8" TYPICAL
② INTER. BRACKET & RAIL BRACING REQUIRED BETWN LEVEL 65'-9" AND 68'-9" - SEE HOISTWAY PLAN

NOTE → FRONT FIXED LEVELS

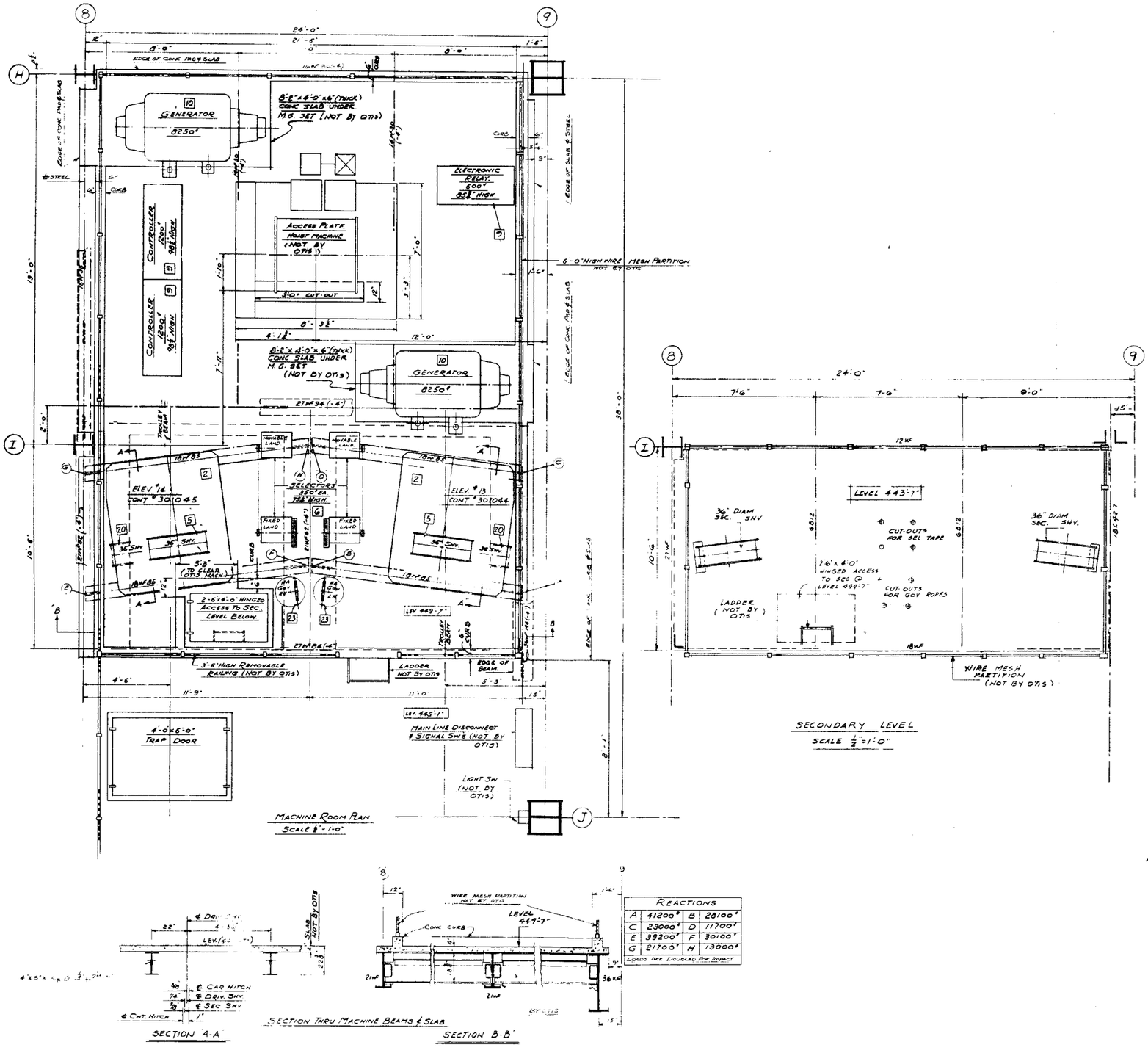
ASSEMBLY BAY NO	TOWER LOCATION
#3	E

HOISTWAY PLAN
SCALE 3/4" = 1'-0"

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301044-PN.

Figure 8-10. Elevator Layout, Plan View, Elevators No. 13 and 14



REACTIONS			
A	41200#	B	28100#
C	23000#	D	117007
E	39200#	F	30100#
G	21700#	H	130000#

LOADS ARE DOUBLED FOR IMPACT

NOTE
1: PLAN VIEW SEE DWG # 301044-PN
2: SECTIONAL ELEVATION SEE DWG # 301038 ELS
3: REFERENCE DATA DWG (XR) SEE DWG # 301038-RD
4: MACHINE ROOM - SEE DWG #
ELEVATOR # 4 - 301038-MR
5 301039-MR
9 & 10 301040-MR
11 & 12 301042-MR
15 301046-MR

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301044-MR.

Figure 8-11. Machine Room Layout, Elevators No. 13 and 14

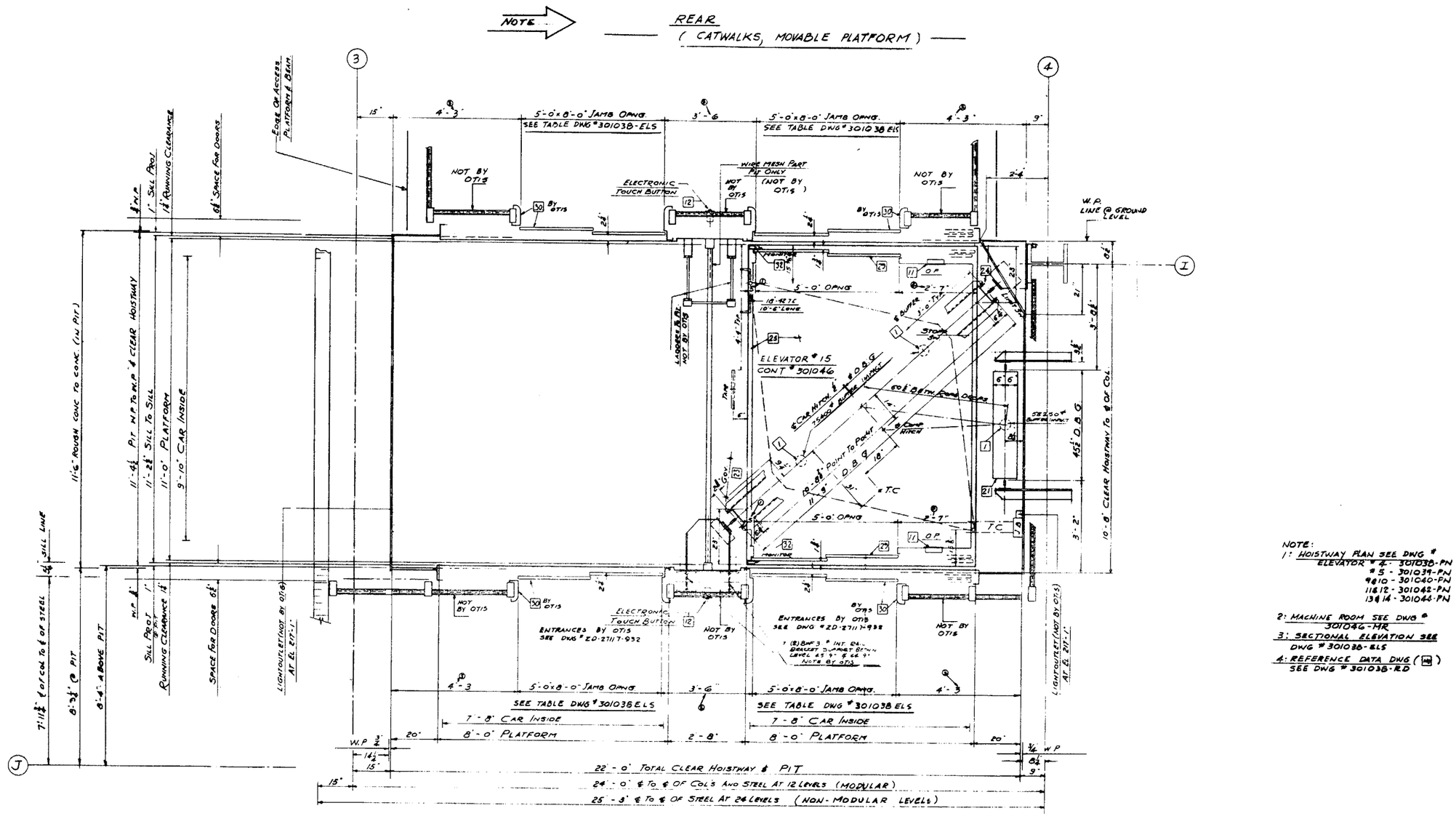
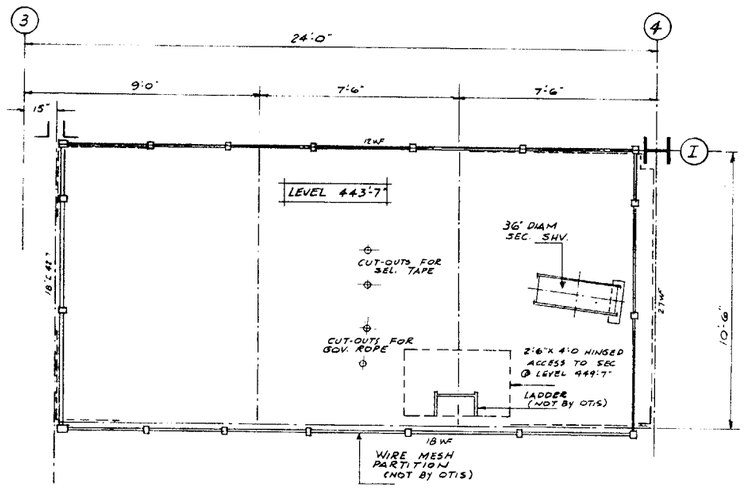
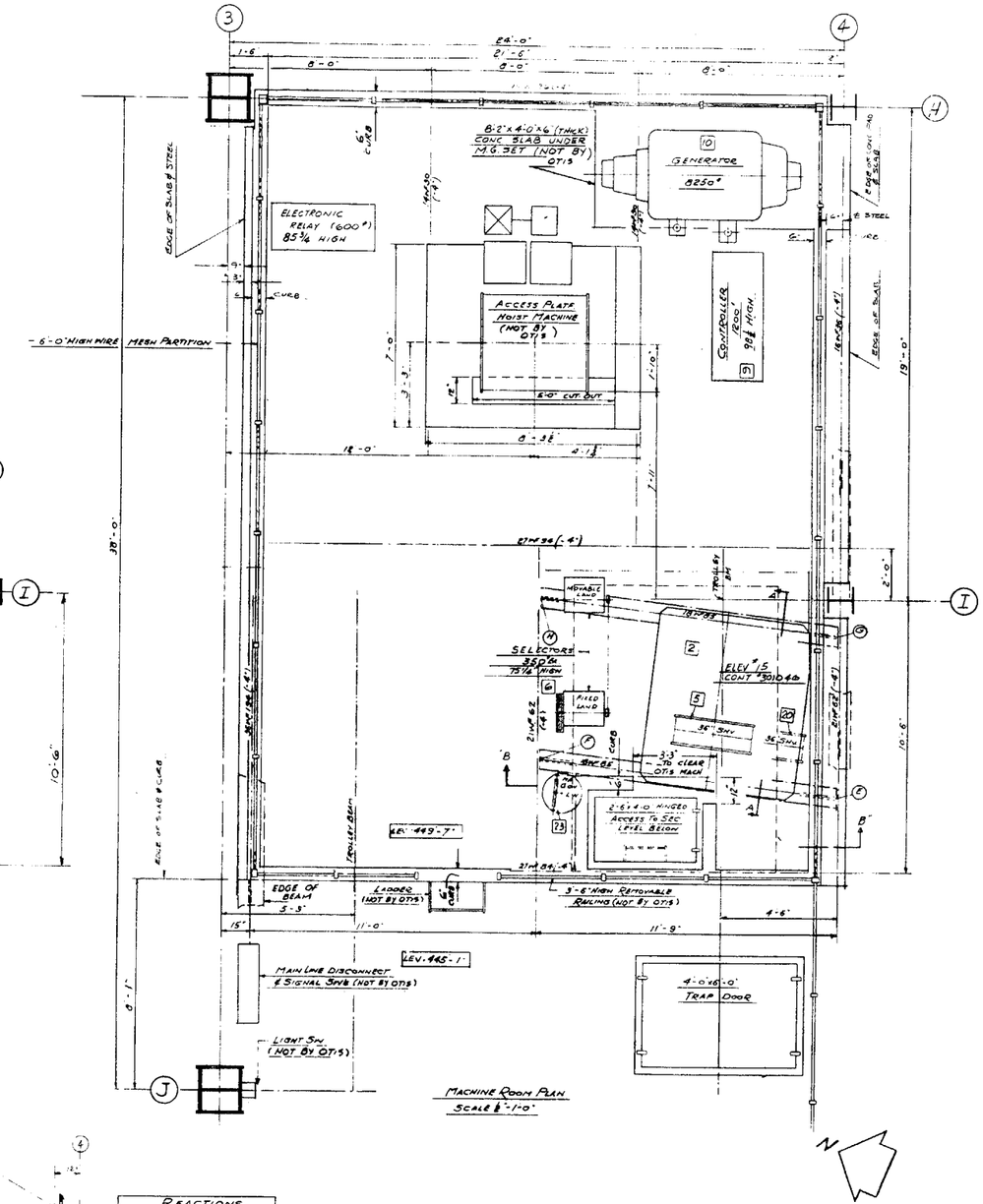

NOTE
REAR
(CATWALKS, MOVABLE PLATFORM)
3
4
I
J
5'-0"x8'-0" JAMB OPNG.
SEE TABLE DWG # 301038-ELS
NOT BY OTIS
ELECTRONIC TOUCH BUTTON
WIRE MESH PART PC ONLY (NOT BY OTIS)
W.P. LINE @ GROUND LEVEL
5'-0" OPNG
ELEVATOR # 15
CONT # 301046
ENTRANCES BY OTIS
SEE DWG # ZD-2711-7-932
7'-8" CAR INSIDE
8'-0" PLATFORM
22'-0" TOTAL CLEAR HOISTWAY & PIT
24'-0" ℄ TO ℄ OF COLS AND STEEL AT 12 LEVELS (MODULAR)
25'-3" ℄ TO ℄ OF STEEL AT 24 LEVELS (NON-MODULAR LEVELS)
11'-6" ROUGH CONC TO CONC. (IN PIT)
11'-4½" P.I.T. TO W.P. & CLEAR HOISTWAY
11'-2½" SILL TO SILL
11'-0" PLATFORM
9'-10" CAR INSIDE
6'-8" SPACE FOR DOORS
EDGE OF ACCESS PLATFORM & BEAM
SILL PROF. & RUNNING CLEARANCE 1½"
LIGHT OUTLET (NOT BY OTIS) AT EL. 217'-1"
7'-11½" ℄ OF CAR TO ℄ OF STEEL
8'-3½" ℄ PIT
6'-4" ABOVE PIT
NOTE
FRONT
FIXED LEVELS
HOISTWAY PLAN
SCALE ¾" = 1'-0"
ASSEMBLY KEY NO. #3
TOWER LOCATION F
NOTE:
1: HOISTWAY PLAN SEE DWG # ELEVATOR # 4 - 301038-PN
5 - 301039-PN
#9&10 - 301040-PN
11&12 - 301042-PN
13&14 - 301044-PN
2: MACHINE ROOM SEE DWG # 301046-MR
3: SECTIONAL ELEVATION SEE DWG # 301036-ELS
4: REFERENCE DATA DWG (RD) SEE DWG # 301038-RD
R1 = 1485#
* F = 20,655#
R2 = 850#
RAIL FORCES AT SAFETY APPLICATION
* FOR DESIGN OF PIT, THIS FORCE MUST BE DOUBLE FOR IMPACT
PLAN
ELEVATION
RAIL BKT SPACING
@ 12'-8" TYPICAL
2 INTER RAIL BRACKET SUPPORTS REQUIRED BETWEEN LEVEL 43'-9" & 64'-9" SEE HOISTWAY PLAN.
NOTE:
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301046-PN.

Figure 8-12. Elevator Layout, Plan View, Elevator No. 15



LEVEL 443'-7"
SECONDARY LEVEL

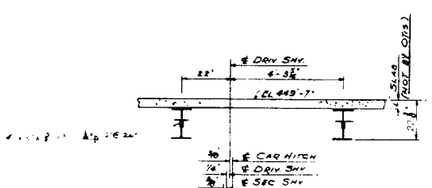
SCALE $\frac{1}{2}$"=1'-0"



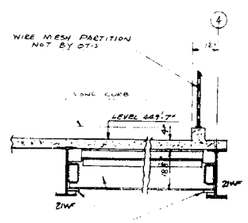
Machine Room Plan

Scale $\frac{1}{4}$"-1'-0"

NOTE
1: PLAN VIEW SEE DWG # 301046-PN
2: SECTIONAL ELEVATION SEE DWG # 301038 EL 5
3: REFERENCE DATA DWG (MR) SEE DWG # 301038-RD
4: MACHINE ROOM SEE DWG.
ELEVATOR #4 301038-MR
#5 301039-MR
#9&10 301040-MR
11&12 301042-MR
13&14 301044-MR



SECTION A-A



SECTION B-B

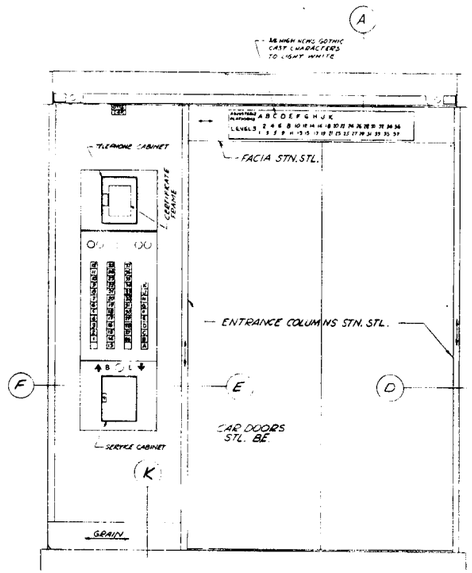
SECTION THRU MACHINE BEAMS & SLAB

REACTIONS			
A	41200#	B	28100#
C	29000#	D	11700#

NOTE:

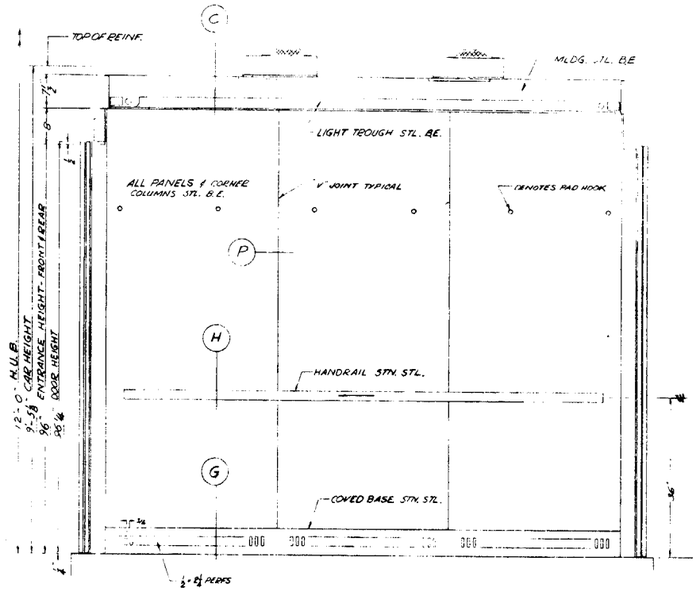
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301046-MR.

Figure 8-13. Machine Room Layout, Elevator No. 15

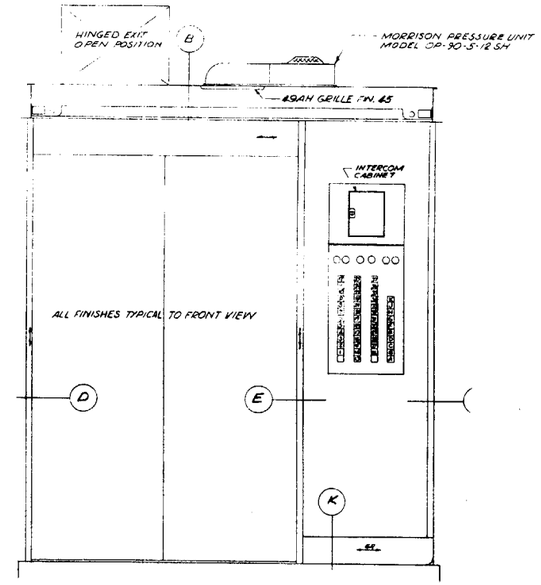


FRONT ELEVATION

LH AS SHOWN FOR ELEV # 4, 9, 13, 15
RH OPPOSITE FOR ELEV # 5, 10, 12,

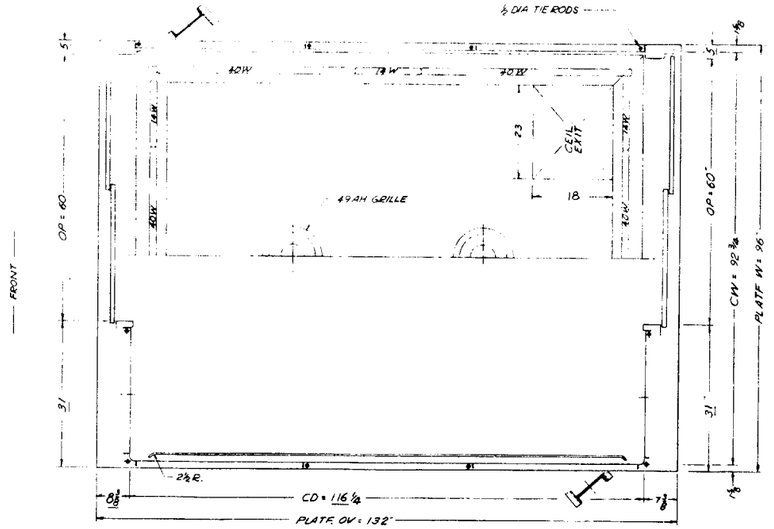


SIDE ELEVATION



REAR ELEVATION

RH AS SHOWN FOR ELEV # 4, 9, 13, 15
LH OPPOSITE FOR ELEV # 5, 10, 12,



HALF FLOOR & CEILING PLAN

AS SHOWN FOR ELEV # 4 - 9 - 13 - 15
OPPOSITE FOR ELEV # 5 - 10 - 12

NOTE A
ALL BE STEEL SURFACES, BOTH EXTERIOR & INTERIOR SHALL BE GIVEN AN APPROVED RUST-INHIBITING TREATMENT PRIOR TO FINISH PAINTING.
FINISH PAINTING SHALL CONSIST OF SIX COATS OF BAKED ENAMEL OR LACQUER IN A COLOR TO BE SELECTED BY CONTRACTING OFFICER.

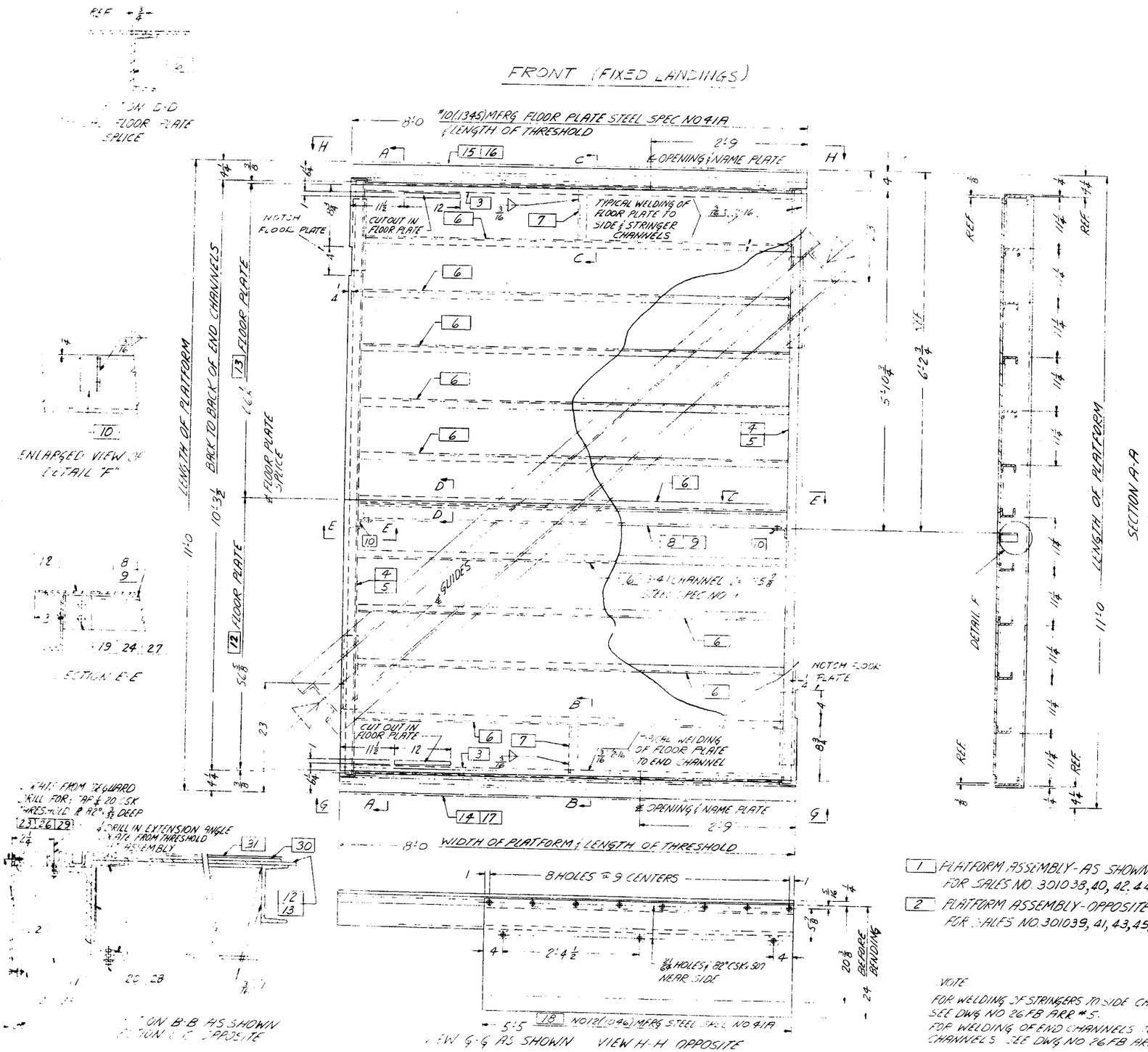
TO WORK LOCATION	AREA	ASS. BAY	OTIS CONTR.#	ELEV
B	HIGH BAY	#2	3010038	4
B		#4	3010039	5
D		#1	3010040	9
D		#1	3010041	10
E		#1	3010043	12
E		#3	3010044	13
F		#3	3010046	15
CONT. SPEC.	PAGE NO.			
	PAGE NO.			

WEIGHT OF CAR LESS COP CPI + CDI = 2780#
SEE DWG ZD-27117A-902 FOR SECTIONS

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING ZD-27117-A-900.

Figure 8-14. Car Enclosure



1 PLATFORM ASSEMBLY - AS SHOWN FOR SALES NO. 301038, 40, 42, 44, 46, 302388

2 PLATFORM ASSEMBLY - OPPOSITE FOR SALES NO. 301039, 41, 43, 45, 303395, 87

NOTE

FOR WELDING OF STRINGERS TO SIDE CHANNELS SEE DWG NO 26FB ARR #5.
FOR WELDING OF END CHANNELS TO SIDE CHANNELS SEE DWG NO 26FB ARR #2

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-700, SHEET 1.

Figure 8-15. Platform Assembly (Sheet 1 of 2)

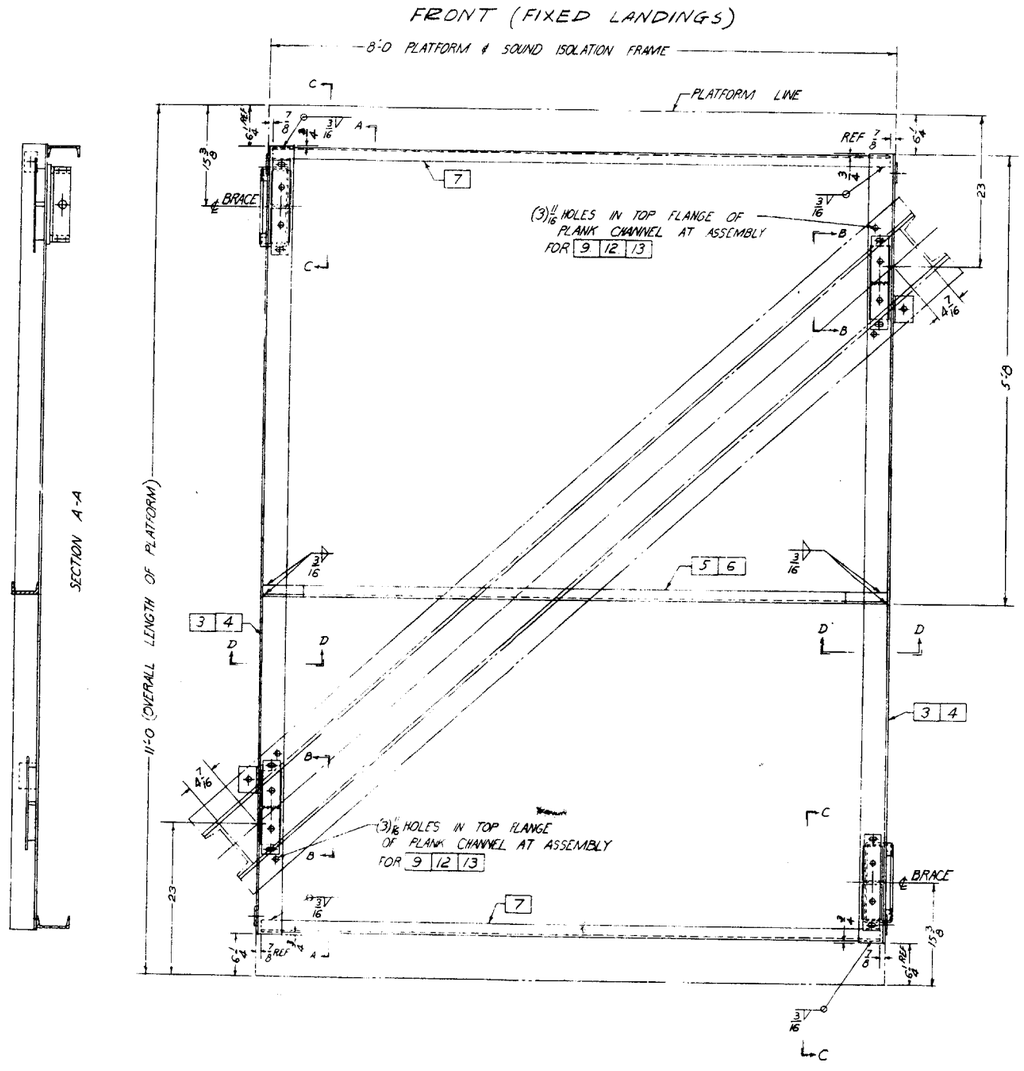
LIST OF MATERIAL — QUANTITIES FOR ONE PLATFORM ASSEMBLY

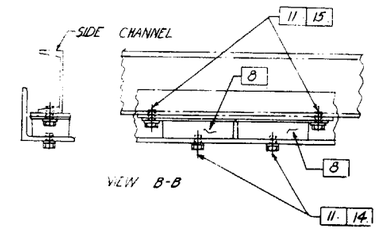
PG NO	NAME	NO REQD 1	NO REQD 2	MATERIAL	GOV'T	MATL SPEC COML	MATL SPEC OTIS	CONTRACTOR DWG NO	CONTRACTOR Service Part No	MANUFACTURER NAME	MANUFACTURER Service Part or Dwg No	UNIT WT LB	REMARKS
1	PLATFORM ASSEMBLY	1						301038 700(SHT2)	1				301038, 301040 301042, 301044 301046
2	PLATFORM ASSEMBLY		1						2				301039, 301041 301043, 301045
3	END CHANNEL	2	2	STEEL		ASTM-A36	SPEC NO. 249	301038 701	15				
4	SIDE CHANNEL	2							10				
5			2				SPEC NO. 9		11				
6	STRINGER CHANNEL	10	10					301038 700(SHT2)	6				
7	CHANNEL	2	2					301038 701	18				
8	ANGLE	1						301038 704	49				
9			1						49A				
10		2	2					301038 701	17				
11	BRACKET	6	6			AISI-M1020	SPEC NO 2	301038 702	22				
12	FLOOR PLATE	1	1			ASTM-A415	SPEC NO 41	301038 700(SHT2)	12				
13		1	1						13				
14	THRESHOLD PLATE	1		NICKEL SILVER		COM'L	SPEC NO. 17	301038 702	20				
15			1						20				
16		1							21				
17			1						21				
18	TOE GUARD	2	2	STEEL		ASTM-415	SPEC NO41A	301038 700(SHT2)	18				
19	$\frac{1}{2}$×1$\frac{1}{2}$ FIN BOLT	4	4					COML					
20	$\frac{3}{8}$×1 FIN BOLT	6	6										
21	$\frac{1}{4}$-20×$\frac{3}{4}$ FLAT MACH SCR	6	6										
22	$\frac{5}{16}$-20×$\frac{1}{2}$ FLAT MACH SCR	16	16										
23	NO12-24×1$\frac{1}{8}$ FLAT MACH SCR	24	24										
24	$\frac{1}{2}$ FIN NUT	4	4										
25	$\frac{1}{4}$-20 FIN NUT	6	6										
26	NO12-24 FIN NUT	24	24										
27	$\frac{1}{2}$ SPRING LW	4	4										
28	$\frac{3}{8}$ INT-EXT LW	6	6										
29	NO12 INTERNAL LW	24	24										
30	FELT												
31	TILE												

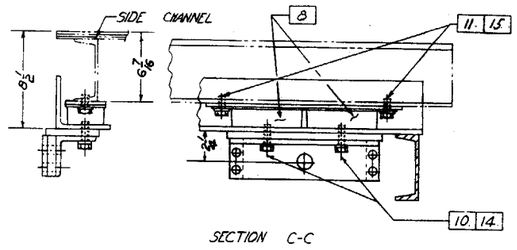
NOTE:

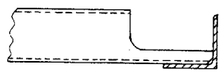
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-700, SHEET 2.

Figure 8-15. Platform Assembly (Sheet 2 of 2)


FRONT (FIXED LANDINGS)
8'-0 PLATFORM & SOUND ISOLATION FRAME
PLATFORM LINE
REF
BRACE
(3) 11/16 HOLES IN TOP FLANGE OF PLANK CHANNEL AT ASSEMBLY FOR 9 12 13
11'-0 (OVERALL LENGTH OF PLATFORM)
5'-8
23
7
5 6
3 4
(3) 11/16 HOLES IN TOP FLANGE OF PLANK CHANNEL AT ASSEMBLY FOR 9 12 13
SECTION A-A
1 ASSEMBLY AS SHOWN FOR CARS NO 301038, 40, 42, 44, 46 & 302388
2 ASSEMBLY OPPOSITE FOR CARS NO 301039, 41, 43, 45, 302386 & 87







NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-703, SHEET 1.

Figure 8-16. Platform Support Frame (Sheet 1 of 2)

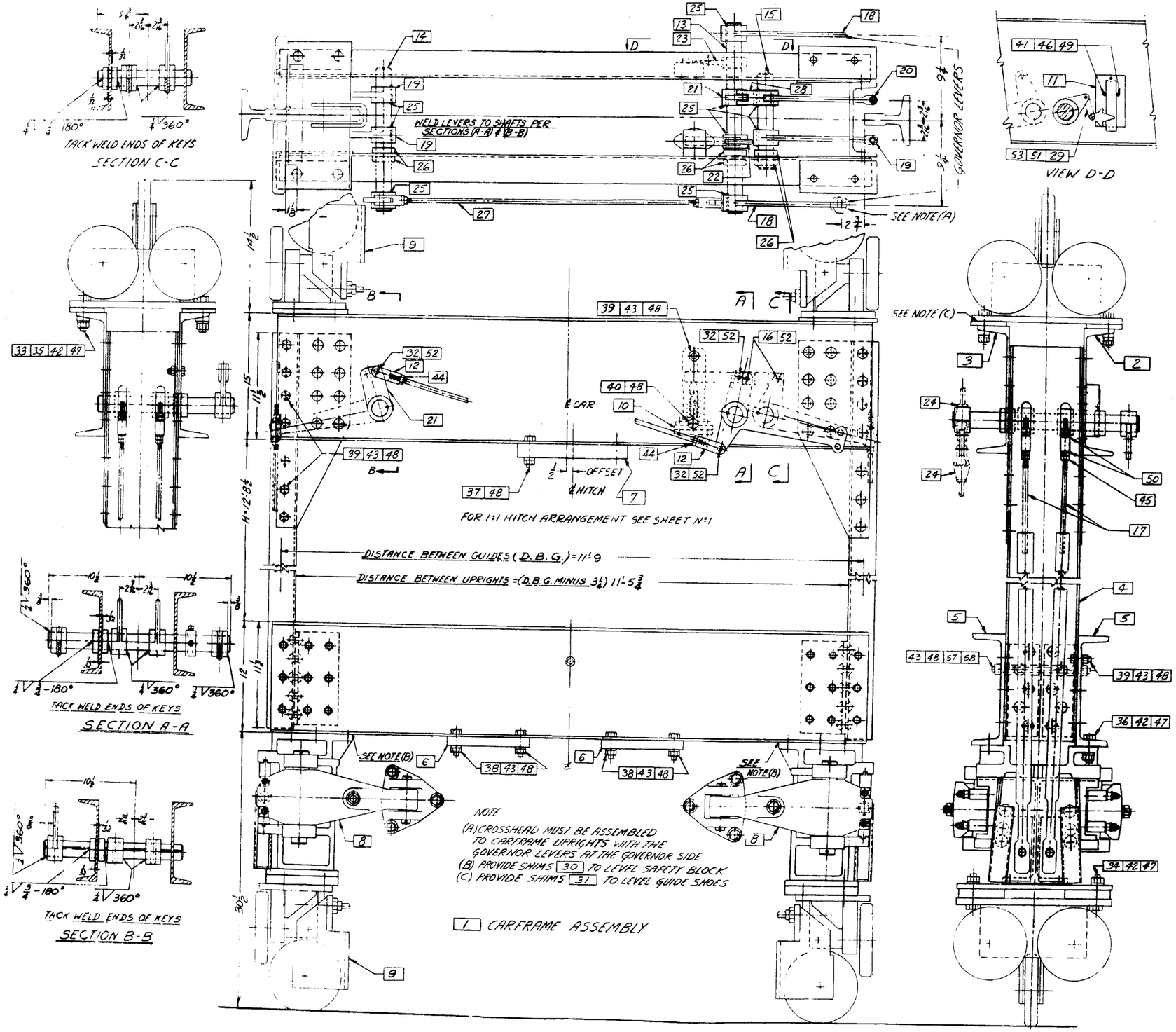
LIST OF MATERIAL —— QUANTITIES FOR ONE SUPPORT FRAME ASSEMBLY

PC. NO.	NAME	NO. REQ'D			MATERIAL	MATL SPEC.			CONTRACTOR		MANUFACTURER		UNIT WT. LB.	REMARKS
						GOV'T	COM'L	OTIS	DWG. NO.	SERVICE PART NO.	NAME	SERVICE PART OR SUPPL. NO.		
1	SUPPORT FRAME ASSEM	1							301038					
2	SUPPORT FRAME ASSEM		1						703 SHT 2					
3	SUPPORT ANGLE	2			STEEL		ASTM-A36	SPEC NO 9	301038 -704	40				
4	SUPPORT ANGLE		2							41				
5	CHANNEL	1								46				
6	CHANNEL		1							47				
7	CHANNEL	2	2							48				
8	BLOCK	8	8		RUBBER & STEEL		ASTM-A36	SPEC NO 7 SPEC NO 44	301038 -705	50				
9	3/8 x 1 3/4 BOLTS	6	6		STEEL				COM'L					
10	1/2 x 1 1/2 BOLTS	4	4											
11	1/2 x 1 BOLTS	12	12											
12	3/8 NUTS	6	6											
13	3/8 SPRING L W	6	6											
14	1/2 SPRING L W	8	8											
15	1/2 INT EXT L W	8	8											

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-703, SHEET 2.

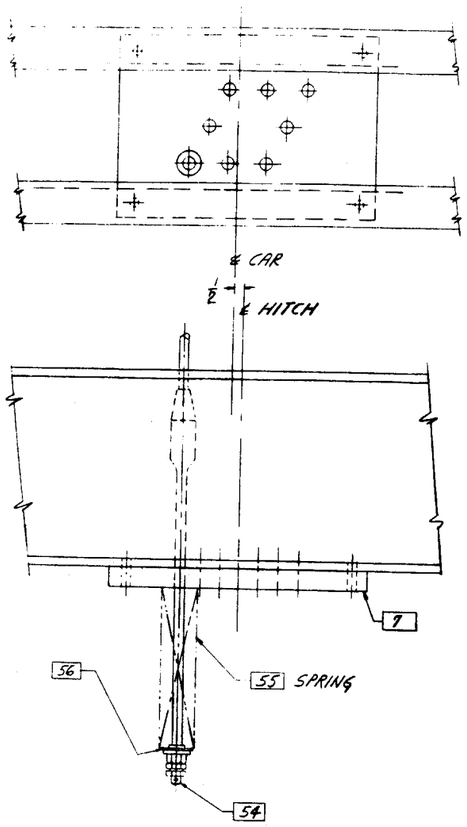
Figure 8-16. Platform Support Frame (Sheet 2 of 2)


TACK WELD ENDS OF KEYS
SECTION C-C
WELD LEVERS TO SHAFTS PER SECTIONS (A-A) & (B-B)
GOVERNOR LEVERS
SEE NOTE (A)
VIEW D-D
SEE NOTE (C)
FOR 1:1 HITCH ARRANGEMENT SEE SHEET Nº1
℄ CAR
OFFSET
℄ HITCH
DISTANCE BETWEEN GUIDES (D.B.G.) = 11'-9
DISTANCE BETWEEN UPRIGHTS = (D.B.G. MINUS 3¼) 11'-5¾
TACK WELD ENDS OF KEYS
SECTION A-A
TACK WELD ENDS OF KEYS
SECTION B-B
SEE NOTE (B)
SEE NOTE (B)
NOTE
(A) CROSSHEAD MUST BE ASSEMBLED TO CARFRAME UPRIGHTS WITH THE GOVERNOR LEVERS AT THE GOVERNOR SIDE
(B) PROVIDE SHIMS 30 TO LEVEL SAFETY BLOCK
(C) PROVIDE SHIMS 31 TO LEVEL GUIDE SHOES
1 CARFRAME ASSEMBLY

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-708, SHEET 1.

Figure 8-17. Carframe and Safety (Sheet 1 of 2)



1:1 HITCH ARRANGEMENT

GOVERNOR END

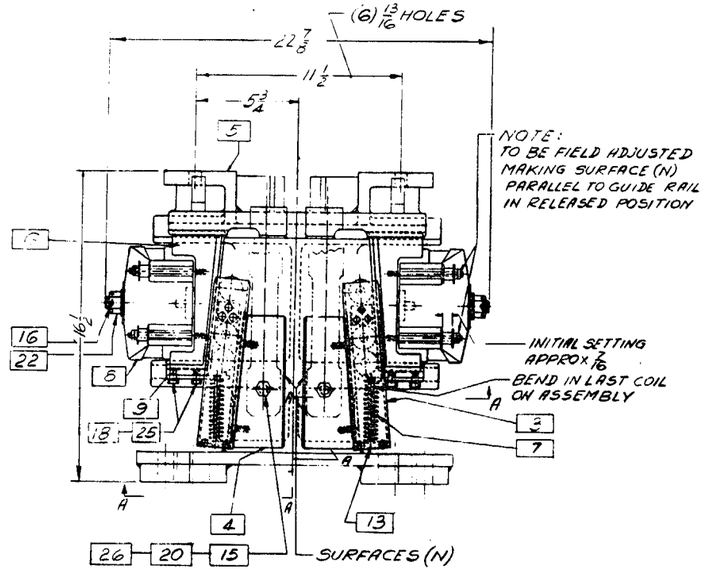
LIST OF MATERIAL —— QUANTITIES FOR ONE CARFRAME ASSEMBLY

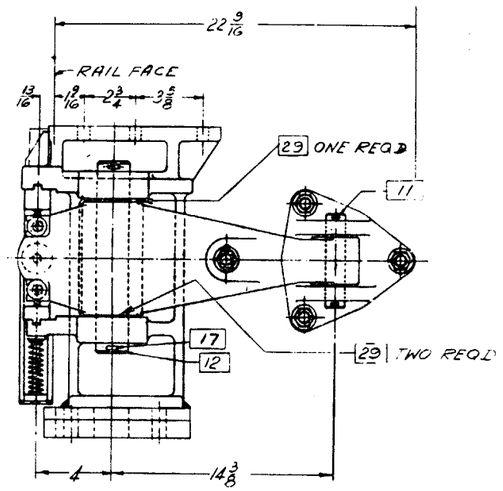
PC NO	NAME	NO REQ'D	MATERIAL	MATL SPEC GOVT	MATL SPEC COML	MATL SPEC OTHER	CONTRACTOR DWG NO	CONTRACTOR SERVICE PART NO	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR STK NO	UNIT WT LB	REMARKS
1	CARFRAME ASSEMBLY	1					301038 708(SHT)	1				
2	CROSSHEAD CHANNEL	1	STEEL		ASTM-A36	SPEC. 9	3010338 709	90				
3		1						91				
4	UPRIGHT CHANNEL	2					301038 710	100				
5	PLANK CHANNEL	2						101				
6	BUFFER PLATE	2				SPEC. 2		102				
7	HITCH PLATE	1						103				
8	TYPE (D) F&C SAFETY ASSEMBLY	2					301038 730	1				FOR OA RAIL
9	8" DIA ROLLER GUIDE	4					301038 -744	1				FOR OA RAIL
10	RELEASING CARRIER	1					6498A	PRT 2				
11	SAFETY SWITCH ASSEM.	1					6098D	609803				
12	CLEVIS	2	CAST IRON			SPEC. 3	338P	338P1				
13	SHAFT	1	STEEL		AISI-C1018	SPEC. 10	1494A1A	1494A17				
14		1						1494A18				
15		1					301038	281				
16	PIN	2					728	282				
17	LIFT ROD	4					301038 726	240				
18	LEVER (GOV ROPE)	2	CAST STEEL		ASTM-A27 GR 70-36	SPEC. 1	B3078	B30781				
19	LEVER (LIFT ROD)	3					B2804D	B28402				
20		1					3071AH	3071AH1				
21	LEVER	2					B2810D	B28001				
22		1					301038 728	290				
23		1	CAST IRON		ASTM-A48 CL 20A	SPEC. 20	F2880FD	F2880FD2				
24	GOV ROPE SOCKET	2	CAST STEEL		ASTM-A27 GR 70-36	SPEC. 1	227C	227C3				
25	KEY	9	STEEL		AISI-C1018	SPEC. 18	192E	192E23				
26	COLLAR	6				SPEC. 2	462W	462W52				
27	CONNECTING ROD	1					96VA					B-9-4
28	LINK	1			AISI-M1020		301038 728	280				
29		1			ASTM-A303	SPEC. 41A	430JA	430JA1				
30	SHIM	25			COML		255BX	255BX4				
31		25						255BX5				
32	PIN	3			AISI-C1018	SPEC. 10	82A	B2A7				
33	BEVEL WASH.	8	CAST IRON			SPEC. 3	131A	131A3				
34	⅜x3¾ FIN BOLT	8	STEEL		COML							
35	⅜x3½ FIN BOLT	8										
36	⅜x2¾ FIN BOLT	12										
37	⅜x3 ASKEW BOLT	4										
38	⅜x2½ FIN BOLT	8										
39	⅜x2¼ FIN BOLT	65										
40	⅜x1 FIN BOLT	1										
41	¼-20x⅜ RD. MACH. SCR.	2										
42	¼ FIN NUT	28										
43	⅜ FIN NUT	97										
44	½ FIN NUT	2										
45	½ FIN JAM NUT	16										
46	¼-20 HEX. MS. NUT	2										
47	¼ SPRING LW	28										
48	⅜ SPRING LW	79										
49	¼ INT LW	2										
50	½ S.A.E. WASH.	8										
51	⅜ S.A.E. WASH.	1										
52	3/32x¾ COT. PIN	10										
53	1/16x¾ COT. PIN	1										
54	THIMBLE ROD ASSEM. CONSISTING OF	8	STEEL		AISI-C1035	SPEC. 13	229D	22903				
	THIMBLE ROD	1						22904				
	KEYED WASHER	1			AISI-C1018		131B6	131B61				QUANTITIES GIVEN ARE TO MAKE ONE ASSEM. P.C. NO. 54
	⅞ FIN NUT	1					COML	COML				
	LOCK NUT	1			AISI-C1018	COML	67Y	67Y3 67Y4				
	¾-16x1¼ COT. PIN	1										
55	SPRING	8			ASTM-A229 OR 6B	SPRING # SPEC NUMB	90JD	90JD4				
56	SPRING SEAT WASHER	8			ASTM-A303	SPEC 41A	131BS	131BS3				
57	PIPE SPACER	1			ASTM-A53	COML	377AB	377AB1				
58	THREADED ROD	1			AISI-C1018	SPEC. 2	96H	96H139				

NOTE:

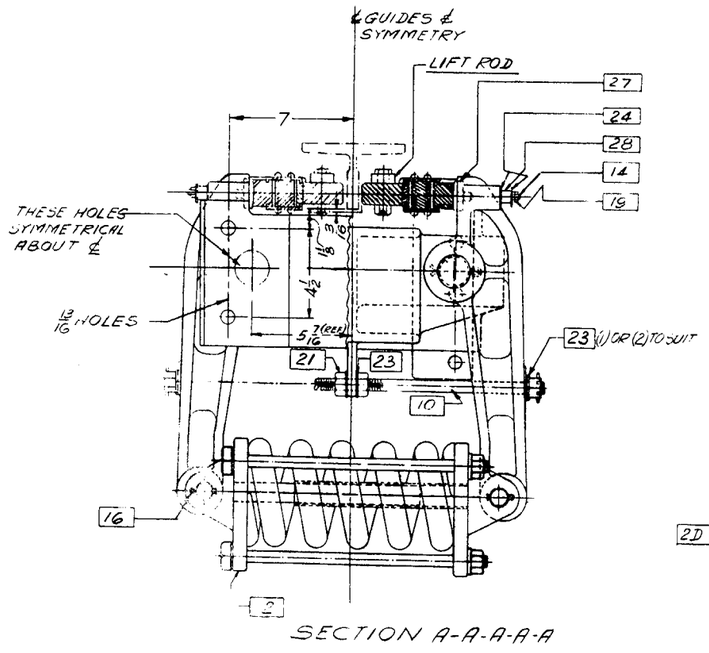
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-708, SHEET 2.

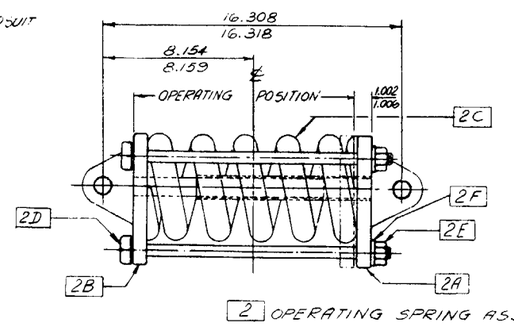
Figure 8-17. Carframe and Safety (Sheet 2 of 2)





1 TYPE (D) F.G.C. SAFETY ASSEMBLY





2 OPERATING SPRING ASSEMBLY

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-730, SHEET 1.

Figure 8-18. Car Safety (Sheet 1 of 2)

LIST OF MATERIAL — QUANTITIES FOR ONE SAFETY ASSEMBLY

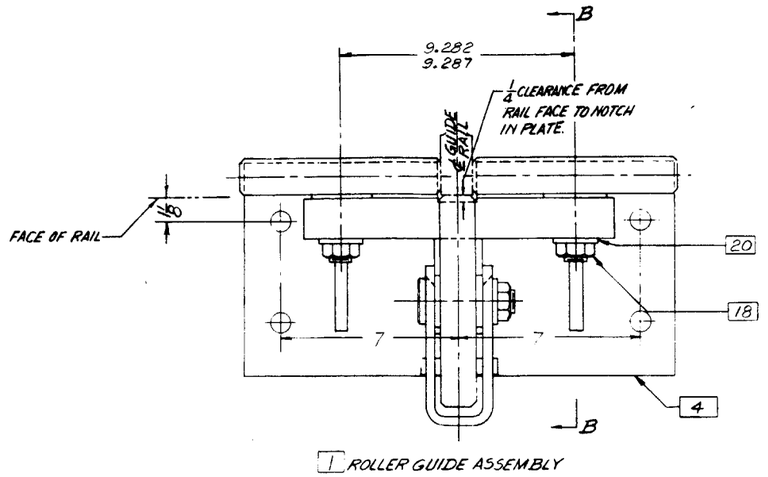
PC. NO.	NAME	NO. REQ'D				MATERIAL	MATL. SPEC. GOV'T	MATL. SPEC. COM'L.	MATL. SPEC. OTIS	CONTRACTOR DWG. NO.	CONTRACTOR [illegible]	MANUFACTURER NAME	MANUFACTURER [illegible]	UNIT WT. LB	REMARKS
1	TYPE(D) F.G.C. SAFETY ASSEMBLY	1	—	—	—	—	—	—	—	301038 -730	1				
2	OPERATING SPRING ASSEMBLY CONSISTING OF	1	—	—	—	—	—	—	—	301038 -711	110				
	2A SPRING SEAT ASSEMBLY FEMALE END	1	—	—	—	DUCTILE IRON GR 70-50-05	—	ASTM A339 GR 70-50-05	SPEC N°1 SPEC N°65	301038 -712	122				
	2B SPRING SEAT ASSEMBLY MALE END	1	—	—	—	DUCTILE IRON ROUND BAR	—	ASTM A339 GR 70-50-05 AISI C 1040	SPEC N°67 SPEC N°10		123				
	2C SPRING	1	—	—	—	STEEL	—	ASTM A125	SPRING SPEC N°5	90AE	90AE1				
	2D $\frac{3}{4}$x14 HEX BOLT	3	—	—	—		—	—	COML	301038 -730	22				UNFINISHED
	2E $\frac{3}{4}$ FIN NUT	3	—	—	—		—	—			2E				
	2F $\frac{3}{4}$ S.A.E. WASHER	6	—	—	—		—	—			27				
3	ROLLER CARRIAGE ASSEMBLY CONSISTING OF	2	—	—	—	—	—	—	—	301038 -716	150				
	GUIDE, ROLLER CARRIAGE	2	—	—	—	STEEL	—	AISI C 1018	SPEC N°40	301038 -716	160				QUANTITIES REQD TO MAKE ONE ASSEMBLY PC N°3
	ROLLER	3	—	—	—		—	—	SPEC N°65	301038 -717	170				
	BLOCK	1	—	—	—		—	AISI C 1018	SPEC N°40	301038 -718	180				
	GUIDE SPACER	1	—	—	—		—	AISI C 1018	SPEC N°40	301038 -719	190				
	$\frac{3}{16}$x2$\frac{5}{8}$ FLAT RIVET	5	—	—	—		—	—	COML	301038 -715	—				
4	WEDGE ASSEMBLY CONSISTING OF	2	—	—	—	—	—	—	—	301038 -720	200				
	ROLLER WEDGE	1	—	—	—	CAST IRON	—	ASTM A48 CL 30B	SPEC N°30	301038 -725	250				QUANTITIES REQUIRED TO MAKE ONE ASSEMBLY PC N°4
	GUIDE WEDGE	1	—	—	—	STEEL	—	AISI 4150	—	301038 -721	270				
	SPRING, PIN $\frac{5}{16}$x$\frac{3}{4}$	4	—	—	—	CORROSION RESISTANT STEEL	—	—	COML			SEE NOTE 1			
	$\frac{5}{16}$x$\frac{3}{4}$ FLAT MACH SCR	2	—	—	—	STEEL	—	—	COML	301038 -720	-				
5	SAFETY BLOCK	1	—	—	—	CAST STEEL	—	ASTM A27 GR 70-36	SPEC N°1	301038 -714	140				
6	GUIDE SHOE	2	—	—	—	STEEL	—	AISI 4142		301038 -722	220				
7	SPRING	2	—	—	—		—	ASTM A228	SPRING SPEC N°1	90HB	90HB6				
8	JAW, SAFETY CLAMP	2	—	—	—	CAST STEEL	—	ASTM A148 GR 105-85	SPEC N° 4	301038 -713	130				
9	STOP	2	—	—	—	STEEL	—	AISI 4150	—	477DR	477DR1				
10	ROD	1	—	—	—		—	AISI C1018	SPEC N°2	3-96P	3-96P1				
11	PIN	2	—	—	—		—	AISI B640	SPEC N° 4	301038 -726	260				
12	PIN	2	—	—	—		—	AISI 4142	SPEC N° 105		261				
13	PIN, SPRING	2	—	—	—	STAINLESS STEEL	—	ASTM A276 TYPE 302	SPEC N°83	1-77TH	1-77TH1				
14	ROD	4	—	—	—	STEEL	—	AISI C1018	SPEC N°10	96H	96H182				
15	BOLT	2	—	—	—		—	AISI 4142	SPEC N°105	301038 -723	230				
16	$\frac{1}{8}$x1$\frac{1}{2}$ COTTER PIN	6	—	—	—		—	—	COML	301038-730	16				
17	$\frac{1}{4}$x2$\frac{1}{4}$ COTTER PIN	4	—	—	—		—	—	COML		17				
18	$\frac{3}{8}$x$\frac{3}{4}$ FIN BOLT	4	—	—	—		—	—			18				
19	$\frac{1}{4}$ FIN JAM NUT	8	—	—	—		—	—			19				
20	$\frac{1}{2}$ FIN SLOT NUT	2	—	—	—		—	—			20				
21	$\frac{5}{8}$ FIN NUT	2	—	—	—		—	—			21				
22	$\frac{5}{8}$ FIN SLOT NUT	2	—	—	—		—	—			22				
23	$\frac{5}{8}$ STD WASHER	6	—	—	—		—	—		127AD	127AD7				
24	$\frac{1}{4}$ SPECIAL WASHER	8	—	—	—		—	ASTM A303	SPEC N°41	127F	127F48				
25	$\frac{3}{8}$ SPRING L W	4	—	—	—		—	—	COML	301038 -730	25				
26	$\frac{3}{32}$x1$\frac{1}{4}$ COTTER PIN	2	—	—	—		—	—			26				
27	BUTTON, JAW	2	—	—	—		—	—	SPEC N°5	301038 -727	270				
28	SPACER	4	—	—	—	RUBBER	—	—	SPEC N°40	3YOAN	3YOAN4				
29	WASHER	6				BRONZE	—	ASTM B21	SPEC N°17	301038 -731	310				

NOTE 1
CORROSION RESISTANT SPRING PIN, VENDOR'S PART N° 79-062-312-0750
MANUFACTURED BY (E S N A) UNION, N.J OR EQUAL

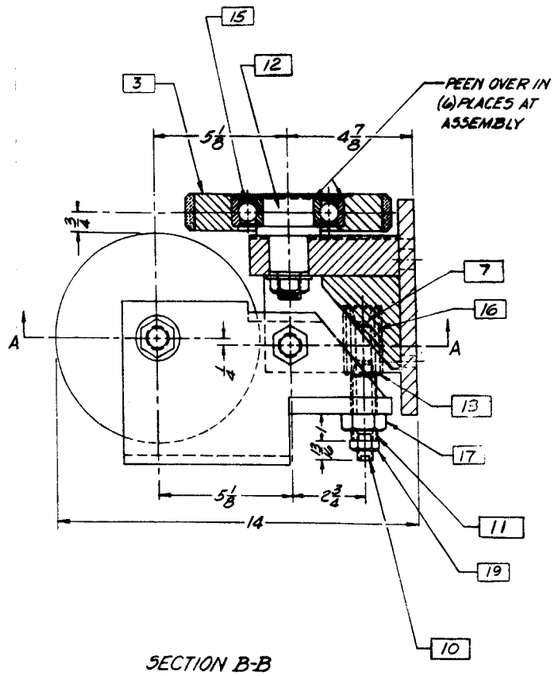
NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-730, SHEET 2.

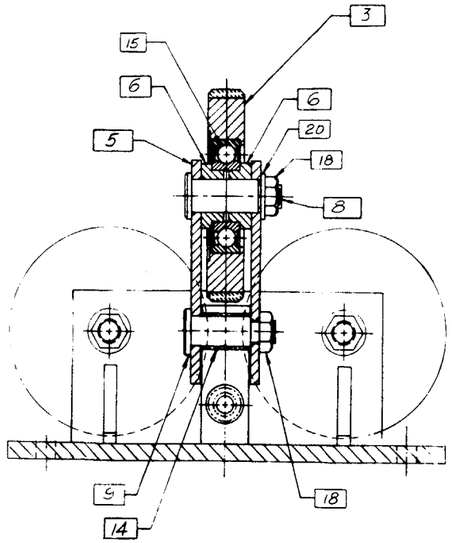
Figure 8-18. Car Safety (Sheet 2 of 2)



1 ROLLER GUIDE ASSEMBLY



SECTION B-B



SECTION A-A

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-744, SHEET 1.

Figure 8-19. 8-Inch Roller Guides (Sheet 1 of 2)

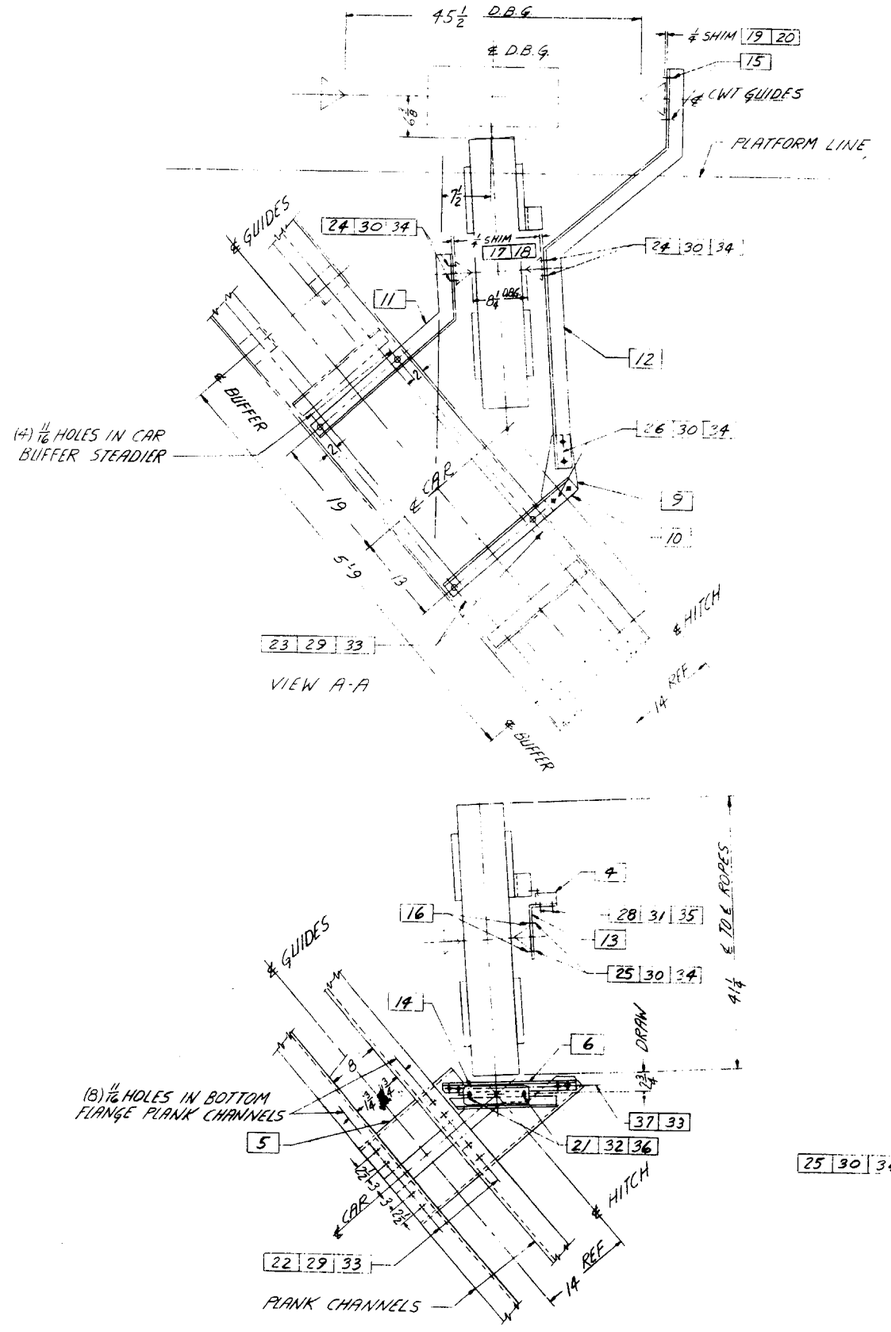
LIST OF MATERIAL —— QUANTITIES FOR ONE ROLLER GUIDE ASSEMBLY

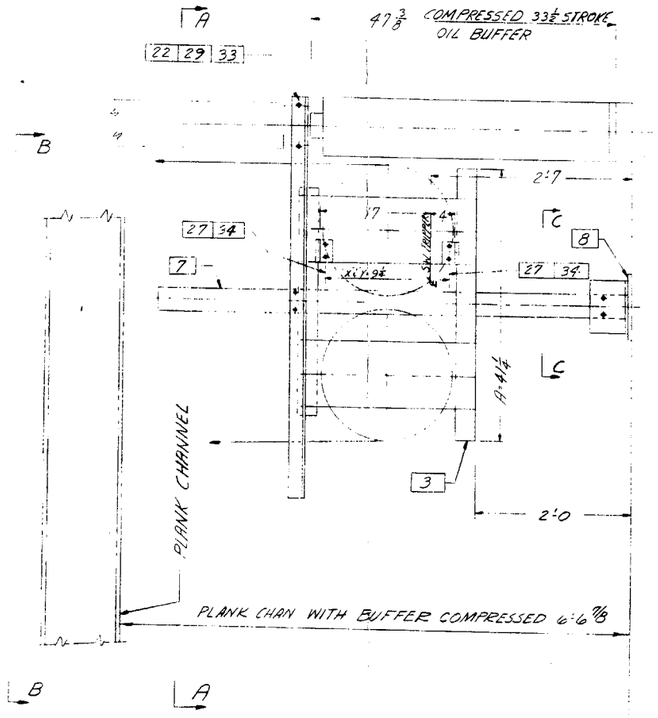
ITEM OR FIND Nº	NAME	NO. REQ'D		MATERIAL	MATL SPEC GOVT.	MATL SPEC COM'L.	MATL SPEC OTIS	CONTRACTOR DWG NO.	CONTRACTOR SERVICE PART NO	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO	UNIT WT LB	REMARKS
1	8" DIA ROLLER GUIDE ASSEMBLY	1						301038 -744 SHT 1					FOR OA RAIL
3	8" DIA ROLLER	3		STEEL		ASTM-A36	2	300845 -721	212				
4	BASE PLATE	1						301038 -745	450				
5	ROLLER ARM	1				AISI-C1018	10	300845-718	180B				
6	BUSHING	2							180C				
7	SPRING SEAT	1							180J				
8	ROLLER STUD	1							180G				
9	PIVOT STUD	1							180D				
10	ADJUSTING SCREW	1							180L				
11	SPRING ADJ SCREW	1							180E				
12	ROLLER SHAFT	2				A151 4140	4		180H				
13	WASHER	1				ASTM A415	41A		180F				
14	OILITE BUSHING	1		BRONZE				900981 -701	19	OILITE	AA1332		
15	BEARING	3								MARLIN ROCKWELL	MRC 9105ZZ		
16	SPRING	1		STEEL		ASTM A229	3	90NC	90NC8				
17	1" FIN JAM NUT	1				COMMERCIAL							
18	7/8 FIN JAM NUT	4											
19	5/8 FIN JAM NUT	1											
20	7/8 SAE WASHER	3											

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-744, SHEET 2.

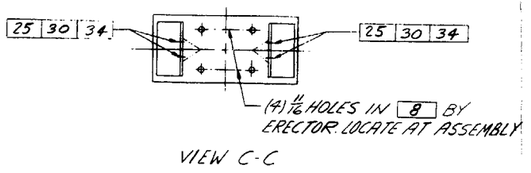
Figure 8-19. 8-Inch Roller Guides (Sheet 2 of 2)





1 ROPE COMPENSATION ARRGT-AS SHOWN CONTRACT NO. 301038,40,42,44,46, 302388

2 ROPE COMPENSATION ARRGT- OPPOSITE CONTRACT NO. 301039,41,43,45, 302386,87

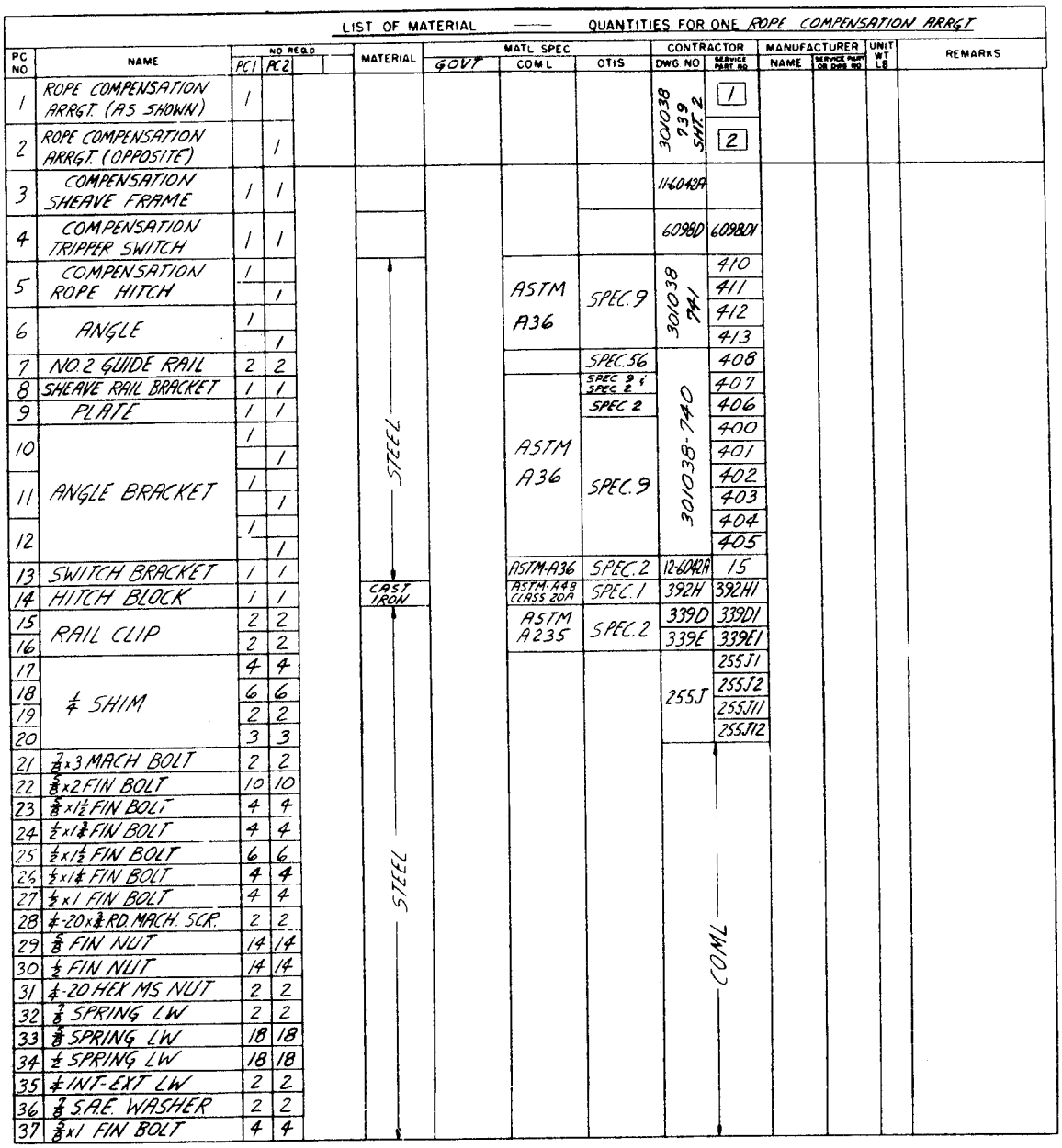


VIEW C-C

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-739, SHEET 1.

Figure 8-20. Rope Compensation and Car Hitch (Sheet 1 of 2)



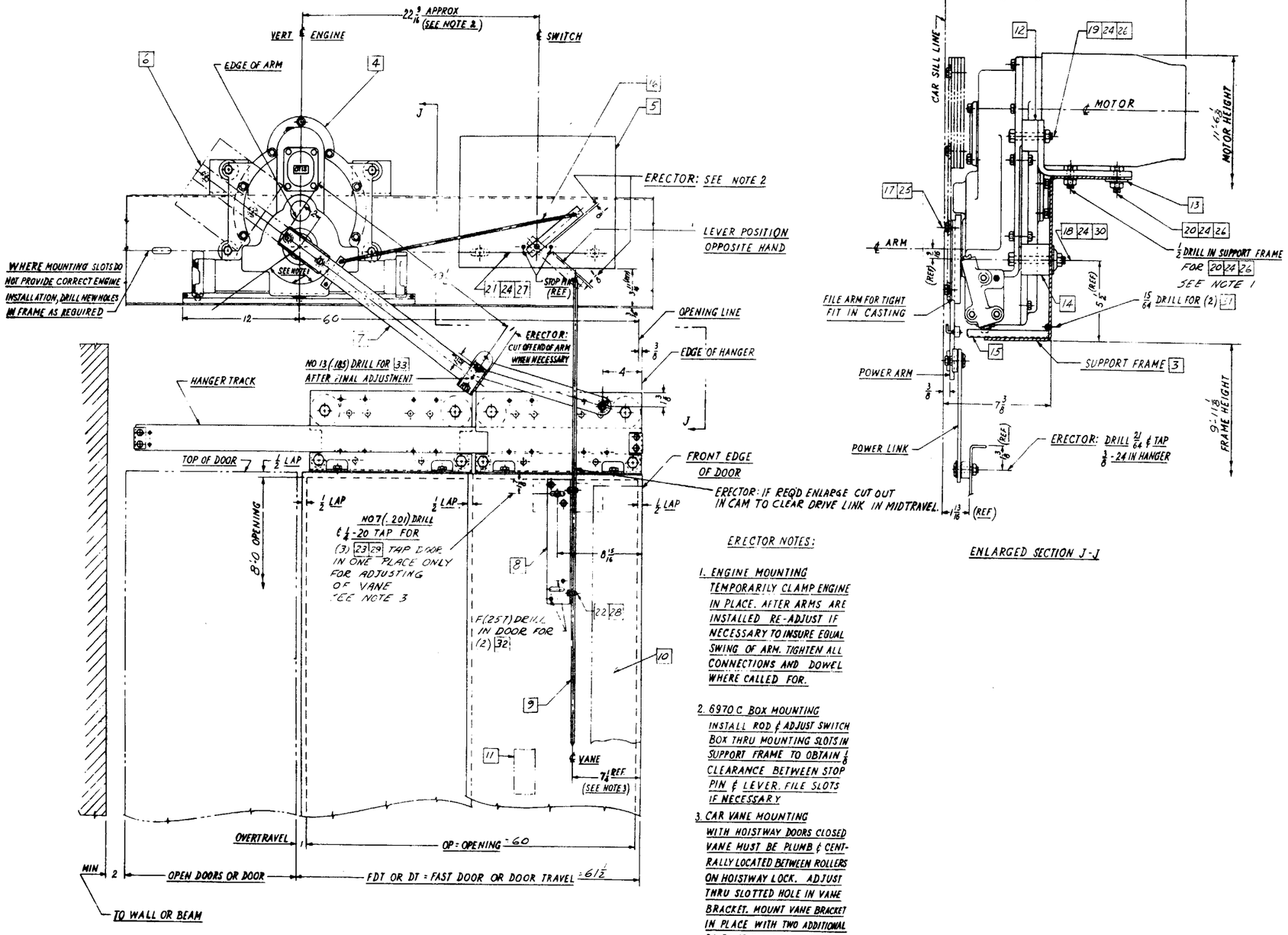
LIST OF MATERIAL — QUANTITIES FOR ONE ROPE COMPENSATION ARRGT

PC NO	NAME	NO REQ'D PC1	NO REQ'D PC2	MATERIAL	MATL SPEC GOVT	MATL SPEC COML	MATL SPEC OTIS	CONTRACTOR DWG NO	CONTRACTOR SERVICE PART NO	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO	UNIT WT LB	REMARKS
1	ROPE COMPENSATION ARRGT. (AS SHOWN)	1						301038 739 SHT 2	1				
2	ROPE COMPENSATION ARRGT. (OPPOSITE)		1						2				
3	COMPENSATION SHEAVE FRAME	1	1					116042A					
4	COMPENSATION TRIPPER SWITCH	1	1					6098D	6098DN				
5	COMPENSATION ROPE HITCH	1		STEEL		ASTM A36	SPEC. 9	301038 741	410				
			1						411				
6	ANGLE	1							412				
			1						413				
7	NO. 2 GUIDE RAIL	2	2				SPEC. 56	301038-740	408				
8	SHEAVE RAIL BRACKET	1	1				SPEC 9 & SPEC 2		407				
9	PLATE	1	1				SPEC 2		406				
10	ANGLE BRACKET	1				ASTM A36	SPEC. 9		400				
			1						401				
11		1							402				
			1						403				
12		1							404				
			1						405				
13	SWITCH BRACKET	1	1			ASTM-A36	SPEC. 2	12-604A	15				
14	HITCH BLOCK	1	1	CAST IRON		ASTM-A48 CLASS 20A	SPEC. 1	392H	392H1				
15	RAIL CLIP	2	2			ASTM A235	SPEC. 2	339D	339D1				
16		2	2					339E	339E1				
17	≠ SHIM	4	4					255J	255J1				
18		6	6						255J2				
19		2	2						255J11				
20		3	3						255J12				
21	⅞x3 MACH BOLT	2	2	STEEL				COML					
22	⅜x2 FIN BOLT	10	10										
23	⅜x1½ FIN BOLT	4	4										
24	½x1¾ FIN BOLT	4	4										
25	½x1½ FIN BOLT	6	6										
26	½x1¼ FIN BOLT	4	4										
27	½x1 FIN BOLT	4	4										
28	¼-20x¾ RD. MACH. SCR.	2	2										
29	⅜ FIN NUT	14	14										
30	½ FIN NUT	14	14										
31	¼-20 HEX MS NUT	2	2										
32	⅞ SPRING LW	2	2										
33	⅜ SPRING LW	18	18										
34	¼ SPRING LW	18	18										
35	¼ INT-EXT LW	2	2										
36	⅞ S.A.E. WASHER	2	2										
37	⅞x1 FIN BOLT	4	4										

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-739, SHEET 2.

Figure 8-20. Rope Compensation and Car Hitch (Sheet 2 of 2)


22 9/16 APPROX (SEE NOTE 2)
VERT ℄ ENGINE
℄ SWITCH
EDGE OF ARM
ERECTOR: SEE NOTE 2
LEVER POSITION OPPOSITE HAND
WHERE MOUNTING SLOTS DO NOT PROVIDE CORRECT ENGINE INSTALLATION, DRILL NEW HOLES IN FRAME AS REQUIRED
SEE NOTE 1
STOP PIN (REF)
OPENING LINE
ERECTOR: CUT OFF END OF ARM WHEN NECESSARY
EDGE OF HANGER
NO 13 (.185) DRILL FOR 33 AFTER FINAL ADJUSTMENT
HANGER TRACK
TOP OF DOOR
FRONT EDGE OF DOOR
ERECTOR: IF REQD ENLARGE CUT OUT IN CAM TO CLEAR DRIVE LINK IN MIDTRAVEL.
8'-0 OPENING
NO 7 (.201) DRILL ℄ 1/4-20 TAP FOR (3) 23 29 TAP DOOR IN ONE PLACE ONLY FOR ADJUSTING OF VANE SEE NOTE 3
F (.257) DRILL IN DOOR FOR (2) 32
VANE
7 1/2 REF (SEE NOTE 3)
OVERTRAVEL
OP = OPENING = 60
MIN
OPEN DOORS OR DOOR
FDT OR DT = FAST DOOR OR DOOR TRAVEL = 61 1/2
TO WALL OR BEAM
18 1/16 WITH 1/2 HP MOTOR (REF)
CAR SILL LINE
MOTOR
MOTOR HEIGHT
ARM
1/2 DRILL IN SUPPORT FRAME FOR 20 24 26 SEE NOTE 1
FILE ARM FOR TIGHT FIT IN CASTING
15/64 DRILL FOR (2) 27
SUPPORT FRAME 3
POWER ARM
POWER LINK
ERECTOR: DRILL 21/64 ℄ TAP 3/8-24 IN HANGER
FRAME HEIGHT
ENLARGED SECTION J-J

1 ARRANGEMENT - RIGHT HAND OPERATOR
2 ARRANGEMENT - LEFT HAND OPERATOR

ERECTOR NOTES:

1. ENGINE MOUNTING
TEMPORARILY CLAMP ENGINE IN PLACE. AFTER ARMS ARE INSTALLED RE-ADJUST IF NECESSARY TO INSURE EQUAL SWING OF ARM. TIGHTEN ALL CONNECTIONS AND DOWEL WHERE CALLED FOR.

2. 6970 C BOX MOUNTING
INSTALL ROD ℄ ADJUST SWITCH BOX THRU MOUNTING SLOTS IN SUPPORT FRAME TO OBTAIN 1/8 CLEARANCE BETWEEN STOP PIN ℄ LEVER. FILE SLOTS IF NECESSARY

3. CAR VANE MOUNTING
WITH HOISTWAY DOORS CLOSED VANE MUST BE PLUMB ℄ CENTRALLY LOCATED BETWEEN ROLLERS ON HOISTWAY LOCK. ADJUST THRU SLOTTED HOLE IN VANE BRACKET. MOUNT VANE BRACKET IN PLACE WITH TWO ADDITIONAL BOLTS AT TOP ℄ TWO EXPANSION TYPE RIVETS AT BOTTOM.

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-800, SHEET 1.

Figure 8-21. Door Operator (Sheet 1 of 2)

LIST OF MATERIAL —— QUANTITIES FOR ONE CAR DOOR OPERATOR

PC NO	NAME	NO REQD			MATERIAL	MATL SPEC			CONTRACTOR		MANUFACTURER		UNIT WT LB	REMARKS
		ARR 1	ARR 2			COM'L	OTIS		DWG NO	SERVICE SHEET NO	NAME	SERVICE PARTS OR SVCE NO		
1	ARRGT R.H. OPERATOR	1							301038 -800	ARR 1				
2	ARRGT L.H. OPERATOR		1							ARR 2				
3	FRAME ARRGT	ONE FRAME ARRGT REQD PER ELEVATOR							301038-802					
4	DRIVE UNIT	1	1						C6970B					WITH ½ H.P. MOTOR
5	CONTROL BOX	1	1						6970C	ARR 1				
6	ARM COUNTERWEIGHT	1	1						6970AE					
7	ARM ASSEMBLY	1	1						301038-801					
8	BRACKET	1	1		STEEL			SPEC NO 4A	283FP	283FP1				
9	VANE	1	1		STEEL			SPEC NO 10	327C	327C6				
10	SAFETY SHOE	1							301038 -808	ARR 1				
			1							ARR 2				
11	LIGHT RAY	1	1						301038-815					
12	BRACKET	2	2		STEEL			SPEC NO 2	283BB	283BB1				
13	WASHER	2	2		STEEL			SPEC NO 10	1275B	1275B1				
14	SPACER	2	2		STEEL			SPEC NO 10	462MA	462MA56				
15	DRIP PAN	1	1		STEEL			SPEC NO 4M	B437BA	B437BA1				
16	ROD	1	1		STEEL			SPEC NO 10	100B	100B3				
17	⅜ x ¾ FIN BOLT	2	2		STEEL				COMMERCIAL					
18	½ x 3½ FIN BOLT	2	2											
19	½ x 3 FIN BOLT	2	2											
20	½ x 1½ FIN BOLT	2	2											
21	½ x 1 FIN BOLT	2	2											
22	⅜-24 x ¾ FIN BOLT	2	2											
23	¼ x ¾ FIN BOLT	3	3											
24	½ FIN NUT	10	10											
25	⅜ INT LW	2	2											
26	½ INT LW	6	6											
27	½ INT EXT LW	2	2						130J	130J11	SHAKEPROOF LOCK WASHER CO	4074-33-00 4026-16-01		
28	⅜ INT EXT LW	2	2							130J4				
29	¼ INT EXT LW	3	3							130J10		4074-22-00 4024-16-01		
30	½ INT EXT LW	2	2							130J6				
31	NO 14 x ⅜ RD Z SCR	2	2						COML					
32	EXPANSION RIVET	2	2						141AD	141AD1	MOTH CHEMICAL CO	38-108-08-91		
33	PIN	1	1						81AX	81AX1				

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-800, SHEET 2.

Figure 8-21. Door Operator (Sheet 2 of 2)

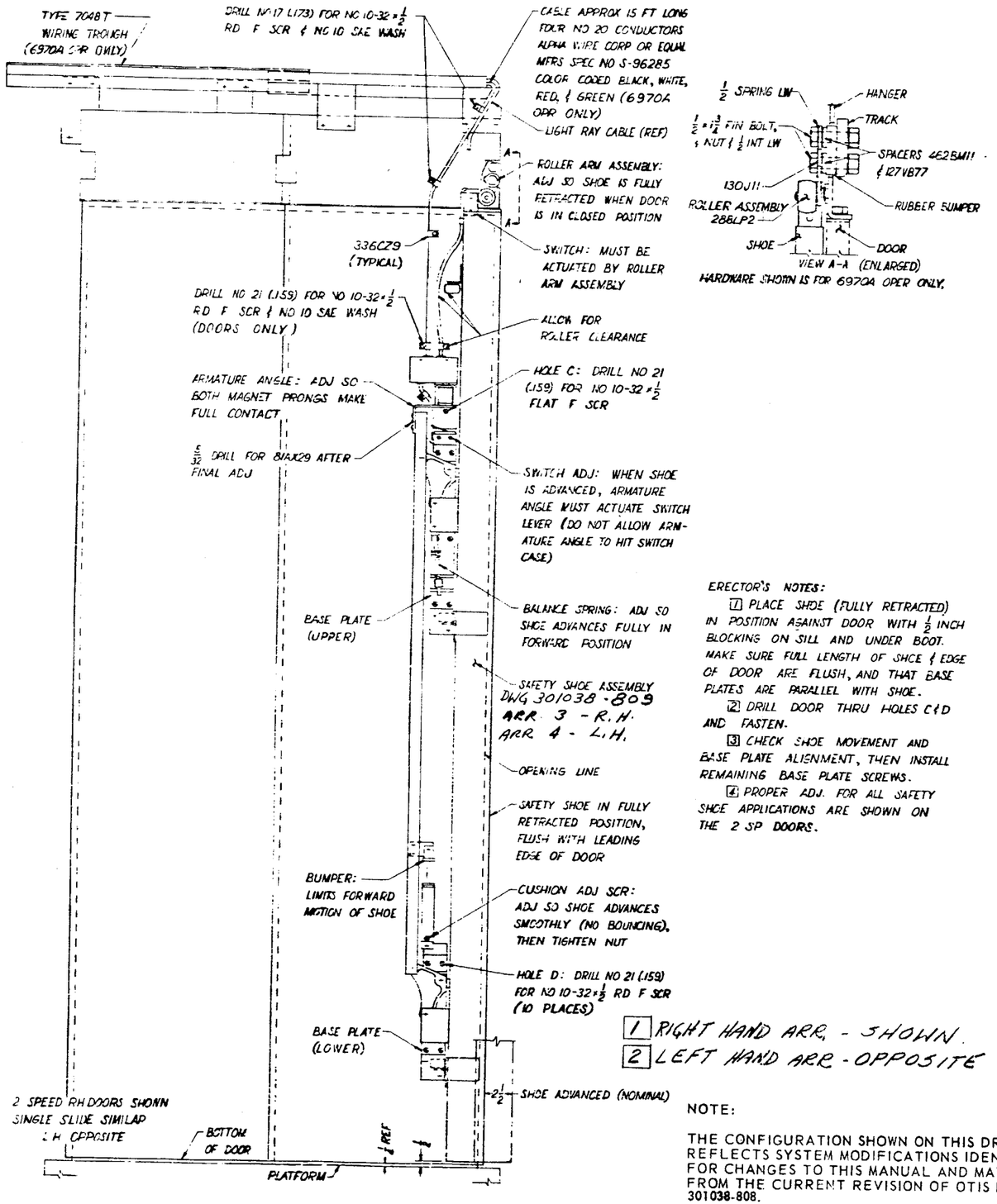
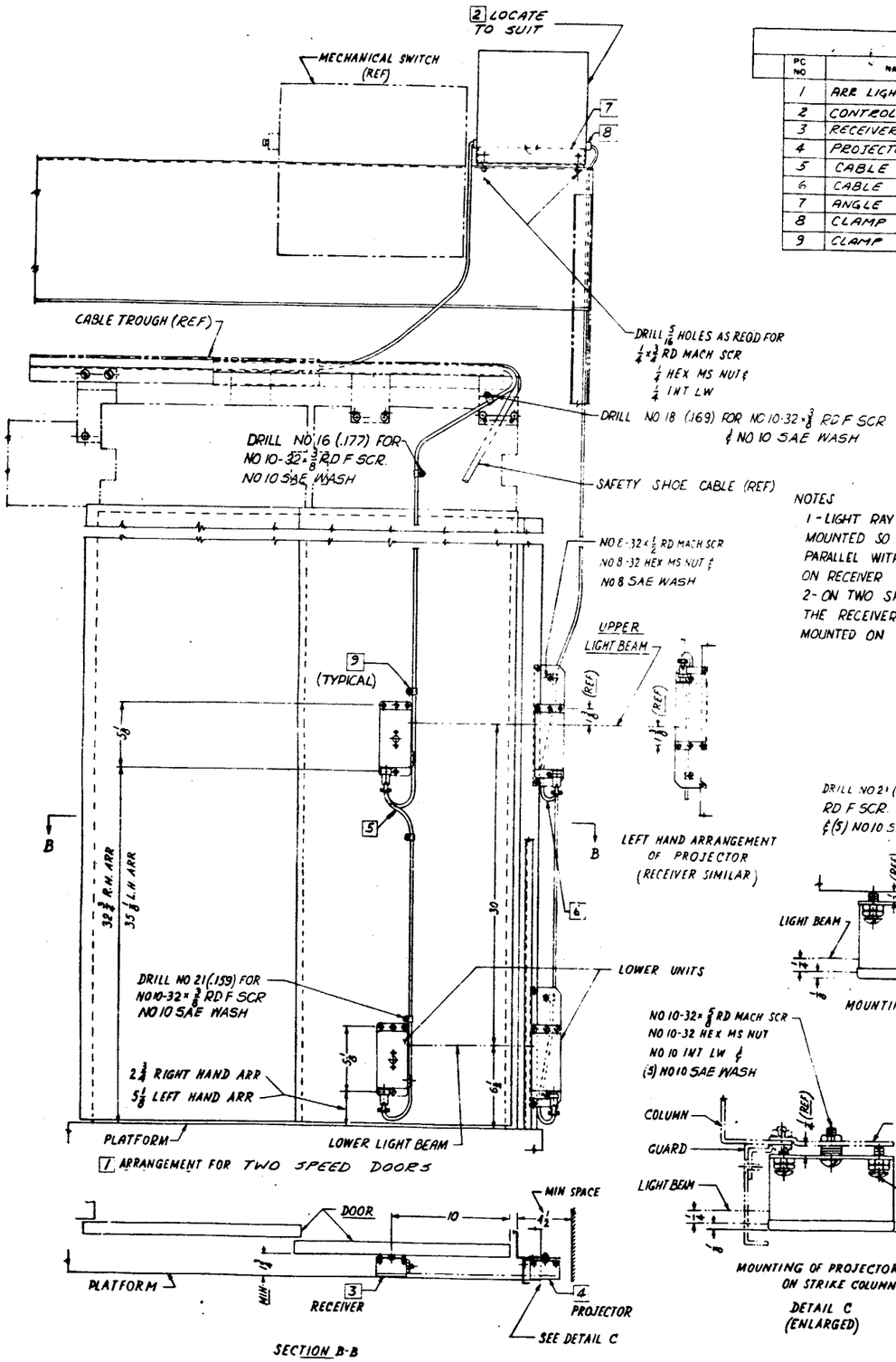

TYPE 704BT WIRING TROUGH (6970A OPR ONLY)
DRILL NO 17 (.173) FOR NO 10-32 x 1/2 RD F SCR & NO 10 SAE WASH
CABLE APPROX 15 FT LONG FOUR NO 20 CONDUCTORS ALPHA WIRE CORP OR EQUAL MFRS SPEC NO S-96285 COLOR CODED BLACK, WHITE, RED, & GREEN (6970A OPR ONLY)
LIGHT RAY CABLE (REF)
ROLLER ARM ASSEMBLY: ADJ SO SHOE IS FULLY RETRACTED WHEN DOOR IS IN CLOSED POSITION
336CZ9 (TYPICAL)
SWITCH: MUST BE ACTUATED BY ROLLER ARM ASSEMBLY
DRILL NO 21 (.159) FOR NO 10-32 x 1/2 RD F SCR & NO 10 SAE WASH (DOORS ONLY)
ALLOW FOR ROLLER CLEARANCE
ARMATURE ANGLE: ADJ SO BOTH MAGNET PRONGS MAKE FULL CONTACT
HOLE C: DRILL NO 21 (.159) FOR NO 10-32 x 1/2 FLAT F SCR
5/32 DRILL FOR 8JAX29 AFTER FINAL ADJ
SWITCH ADJ: WHEN SHOE IS ADVANCED, ARMATURE ANGLE MUST ACTUATE SWITCH LEVER (DO NOT ALLOW ARMATURE ANGLE TO HIT SWITCH CASE)
BASE PLATE (UPPER)
BALANCE SPRING: ADJ SO SHOE ADVANCES FULLY IN FORWARD POSITION
SAFETY SHOE ASSEMBLY DWG 301038-809 ARR 3 - R.H. ARR 4 - L.H.
OPENING LINE
SAFETY SHOE IN FULLY RETRACTED POSITION, FLUSH WITH LEADING EDGE OF DOOR
BUMPER: LIMITS FORWARD MOTION OF SHOE
CUSHION ADJ SCR: ADJ SO SHOE ADVANCES SMOOTHLY (NO BOUNCING), THEN TIGHTEN NUT
HOLE D: DRILL NO 21 (.159) FOR NO 10-32 x 1/2 RD F SCR (10 PLACES)
BASE PLATE (LOWER)
2 1/2 SHOE ADVANCED (NOMINAL)
2 SPEED RH DOORS SHOWN SINGLE SLIDE SIMILAR LH OPPOSITE
BOTTOM OF DOOR
1/4 REF
1/4
PLATFORM
1/2 SPRING LW
HANGER
TRACK
1/2 x 1 3/4 FIN BOLT, & NUT & 1/2 INT LW
SPACERS 462BM11 & 127VB77
130J11
ROLLER ASSEMBLY 288LP2
RUBBER BUMPER
SHOE
DOOR
VIEW A-A (ENLARGED)
HARDWARE SHOWN IS FOR 6970A OPER ONLY.
ERECTOR'S NOTES:
1 PLACE SHOE (FULLY RETRACTED) IN POSITION AGAINST DOOR WITH 1/2 INCH BLOCKING ON SILL AND UNDER BOOT. MAKE SURE FULL LENGTH OF SHOE & EDGE OF DOOR ARE FLUSH, AND THAT BASE PLATES ARE PARALLEL WITH SHOE.
2 DRILL DOOR THRU HOLES C & D AND FASTEN.
3 CHECK SHOE MOVEMENT AND BASE PLATE ALIGNMENT, THEN INSTALL REMAINING BASE PLATE SCREWS.
4 PROPER ADJ. FOR ALL SAFETY SHOE APPLICATIONS ARE SHOWN ON THE 2 SP DOORS.
1 RIGHT HAND ARR. - SHOWN.
2 LEFT HAND ARR - OPPOSITE
NOTE:
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-808.

Figure 8-22. Safety Shoe


2 LOCATE TO SUIT
MECHANICAL SWITCH (REF)
7
8
CABLE TROUGH (REF)
DRILL 5/16 HOLES AS REQD FOR 1/4 x 3/4 RD MACH SCR 1/4 HEX MS NUT & 1/4 INT LW
DRILL NO 18 (.169) FOR NO 10-32 x 3/8 RD F SCR & NO 10 SAE WASH
DRILL NO 16 (.177) FOR NO 10-32 x 3/8 RD F SCR. NO 10 SAE WASH
SAFETY SHOE CABLE (REF)
NO 8-32 x 1/2 RD MACH SCR NO 8-32 HEX MS NUT & NO 8 SAE WASH
UPPER LIGHT BEAM
9 (TYPICAL)
5
B
B
32 3/8 R.H. ARR
35 3/8 L.H. ARR
6
30
DRILL NO 21 (.159) FOR NO 10-32 x 3/8 RD F SCR NO 10 SAE WASH
LOWER UNITS
2 3/4 RIGHT HAND ARR
5 1/8 LEFT HAND ARR
PLATFORM
LOWER LIGHT BEAM
7 ARRANGEMENT FOR TWO SPEED DOORS
LEFT HAND ARRANGEMENT OF PROJECTOR (RECEIVER SIMILAR)
DRILL NO 21 (.159) FOR NO 10-32 x 3/8 RD F SCR. & (5) NO 10 SAE WASH
LIGHT BEAM
DOOR
ADJUSTING SCR
SILL LINE
MOUNTING OF RECEIVER
NO 10-32 x 5/8 RD MACH SCR
NO 10-32 HEX MS NUT
NO 10 INT LW &
(5) NO 10 SAE WASH
COLUMN
GUARD
BRACKET
LIGHT BEAM
ADJUSTING SCR
SILL LINE
MOUNTING OF PROJECTOR ON STRIKE COLUMN
DETAIL C (ENLARGED)
MIN SPACE
DOOR
10
PLATFORM
MIN
3
RECEIVER
4
PROJECTOR
SEE DETAIL C
SECTION B-B

LIST OF MATERIAL —— QUANTITIES FOR ONE CAR DOOR OPENING

PC NO	NAME	NO. REQ'D	MATERIAL	MATL SPEC COML	MATL SPEC OTIS	CONTRACTOR DWG NO	CONTRACTOR SERVICE PART NO	MANUFACTURER NAME	MANUFACTURER SERVICE PART NO	UNIT WT LB	REMARKS
1	ARR LIGHT RAY	1				301038 -815	ARR [1]	PHOTOBELL CO. INC.			
2	CONTROL BOX	1				A697IIF	A697IIF1				
3	RECEIVER	2				6971G	6971G1				
4	PROJECTOR	2				6971H	6971H1				
5	CABLE	1				174AR	174AR2				
6	CABLE	1				174AR	174AR1				
7	ANGLE	1	STEEL		STL SPEC 9	272LM	272LM21				
8	CLAMP	2				336FC	336FC1	FYLE ANTOMAL	DNE-3516		
9	CLAMP	7	NYLON			336CZ	336CZ9				

NOTES
1 - LIGHT RAY UNITS MUST BE MOUNTED SO THAT BEAM IS PARALLEL WITH HANGER TRACKS & FOCUSED ON RECEIVER IN ANY DOOR POSITION
2 - ON TWO SPEED OR SINGLE SLIDE DOORS THE RECEIVER SHOULD ALWAYS BE MOUNTED ON THE DOOR

RIGHT HAND - AS SHOWN
LEFT HAND - OPPOSITE

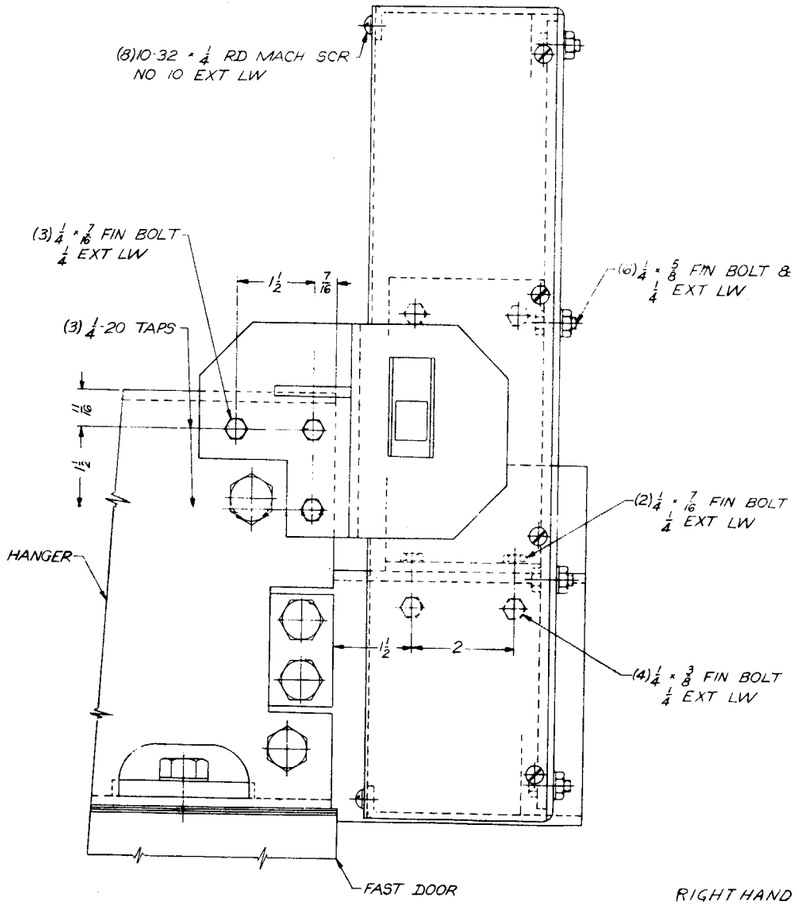
NOTE:

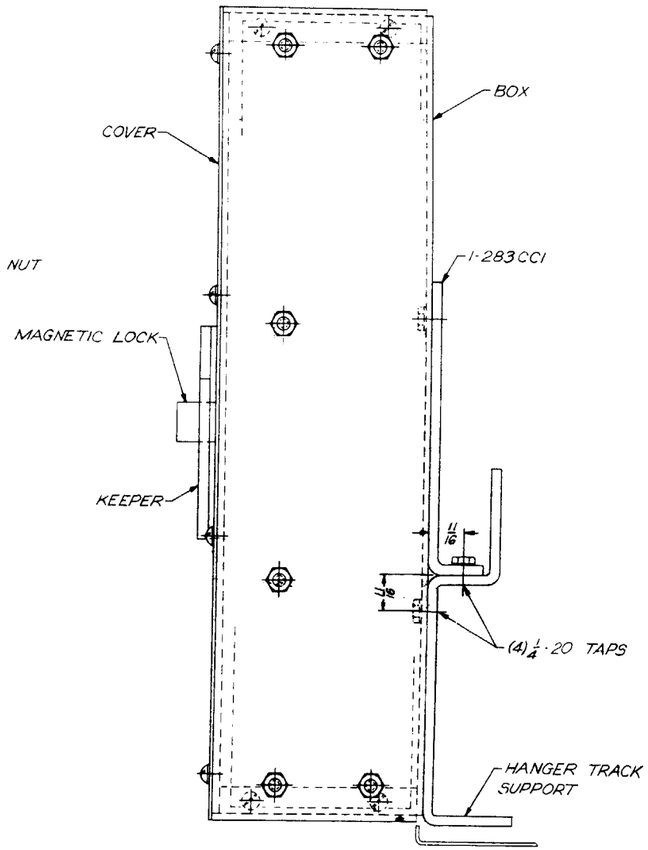
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-815.

Figure 8-23. Light Ray Device

LIST OF MATERIAL — QUANTITIES FOR ONE — REAR CAR DOOR INTERLOCK

CONTRACTOR SERVICE PART NO	NAME	NO REQD	MATERIAL	MATL SPEC COML	MATL SPEC OTIS	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DRG NO	UNIT WT LB	REMARKS
57.6410E ARR 1	MAGNETIC LOCK ASSEMBLY	1							
1-41G2	KEEPER	1							FOR LEFT HAND SLIDE DOORS ONLY
1-285P2	COVER	1	STEEL	ASTM A415	NO 41A				
10-308BG2	BOX	1							
1-283CC1	FORMED ANGLE	1							
57.6410E ARR 2	MAGNETIC LOCK ASSEMBLY	1							
1-41G1	KEEPER	1							FOR RIGHT HAND SLIDE DOORS ONLY
1-285P1	COVER	1	STEEL	ASTM A415	NO 41A				
10-308BG1	BOX	1							
1-283CC1	FORMED ANGLE	1							


(8)10-32 x 1/4 RD MACH SCR NO 10 EXT LW
(3) 1/4 x 7/16 FIN BOLT 1/4 EXT LW
(3) 1/4-20 TAPS
1 1/2
7/16
11/16
1 1/2
(6) 1/4 x 5/8 FIN BOLT & NUT 1/4 EXT LW
(2) 1/4 x 7/16 FIN BOLT 1/4 EXT LW
HANGER
1 1/2
2
(4) 1/4 x 3/8 FIN BOLT 1/4 EXT LW
FAST DOOR



NOTE:
ALL HARDWARE ZINC PLATED PER 26DJ1

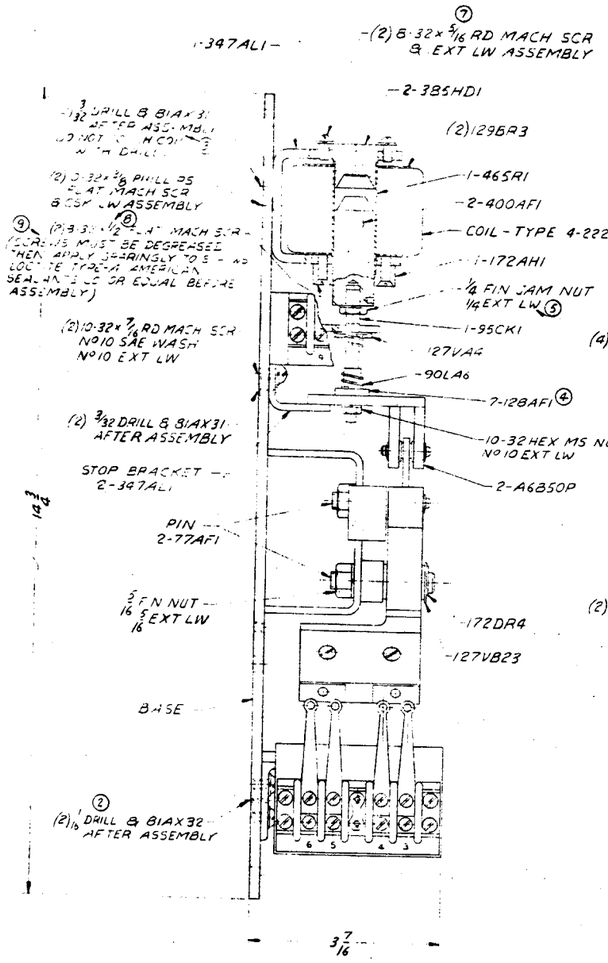
RIGHT HAND SLIDE AS SHOWN
LEFT-HAND SLIDE OPPOSITE

ARR NO	HAND	BOX	COVER	KEEPER	MAGNETIC LOCK	
1	AS SHOWN	10-308BG1	1-285P1	1-41G1	57-6410E	ARR 2
2	OPPOSITE	10-308BG2	1-285P2	1-41G2		ARR 1

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301047-355.

Figure 8-24. Rear Car Door Interlock Arrangement



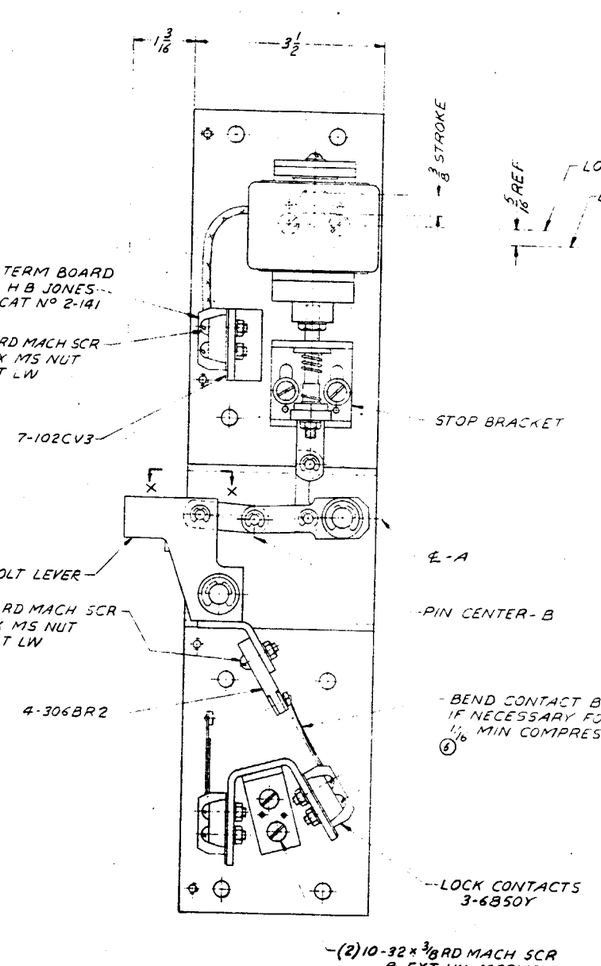

1 3/16
3 1/2
3/8 STROKE
TERM BOARD H B JONES CAT NO 2-141
(4) 8-32 x 3/4 RD MACH SCR 8-32 HEX MS NUT NO 8 EXT LW
7-102CV3
STOP BRACKET
BOLT LEVER
(2) 3-32 x 5/8 RD MACH SCR 8-32 HEX MS NUT NO 8 EXT LW
℄-A
PIN CENTER-B
4-306BR2
BEND CONTACT BLADES IF NECESSARY FOR 1/16 MIN COMPRESSION (6)
LOCK CONTACTS 3-6B50Y
(2) 10-32 x 3/8 RD MACH SCR & EXT LW ASSEMBLY

FIG NO 1

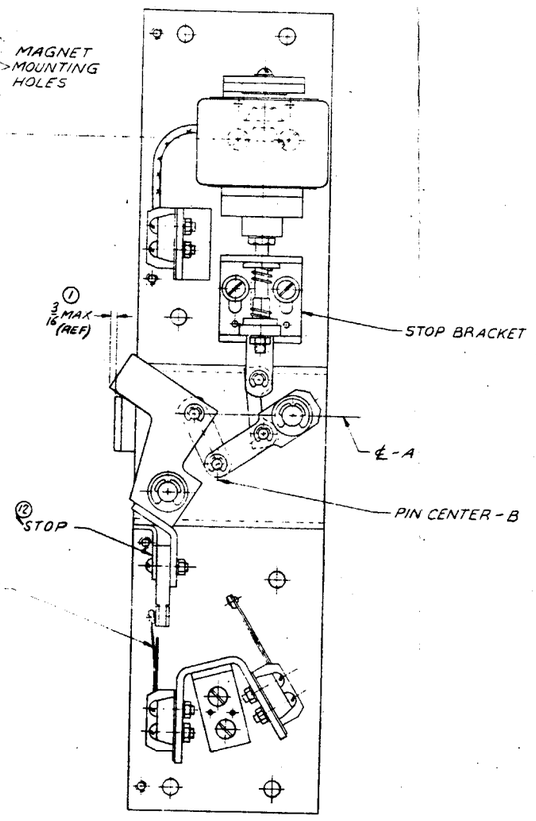


FIG NO 2
(ALL OTHER PARTS SAME AS FIG NO 1)

NOTES

PROCEDURE FOR LOCK PER FIG NO 1

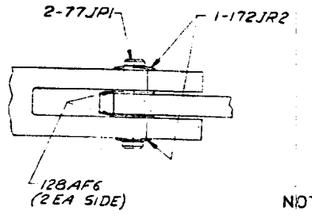
1. WITH COIL DEENERGIZED ADJUST STOP BRACKET FOR PIN CENTER-B TO BE APPROX 1/16 INCH BELOW ℄-A
2. ADJUST CORE FOR 3/8 STROKE

PROCEDURE FOR LOCK PER FIG NO 2

1. WITH COIL ENERGIZED PIN CENTER-B TO BE APPROX 1/16 INCH ABOVE ℄-A
2. ADJUST STOP BRACKET FOR 3/8 MAX STROKE
3. (13) ASSEMBLY BEND STOP TO SEAT FIRMLY AGAINST BASE TO PREVENT CONTACT BOUNCING

ALL HARDWARE CADMIUM PLATED PER 26DJ4

ARR NO	FIG NO	REMARKS (COIL DEENERGIZED)	MAGNET MOUNTED IN LOC	HAND	LOCK CONTACTS 3-6B50Y	BASE	BOLT LEVER	STOP
1	1	LOCKED POSITION	A	AS SHOWN	ARR NO 2	2-306GV1	5-288JL2	—
2				OPPOSITE	ARR NO 1 (10)	2-306GV2	5-288JL3	
3	2	UNLOCKED POSITION	B	AS SHOWN	ARR NO 1	2-306GV1	5-288JL2	1-477D1
4				OPPOSITE	ARR NO 2 (11)	2-306GV2	5-288JL3	1-477D2

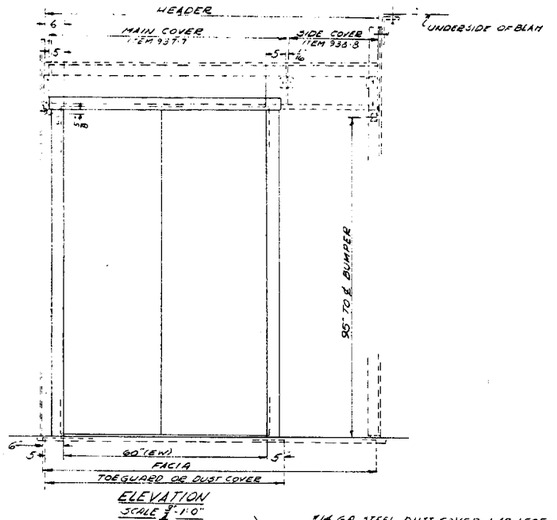


VIEW X-X
(ENLARGED)

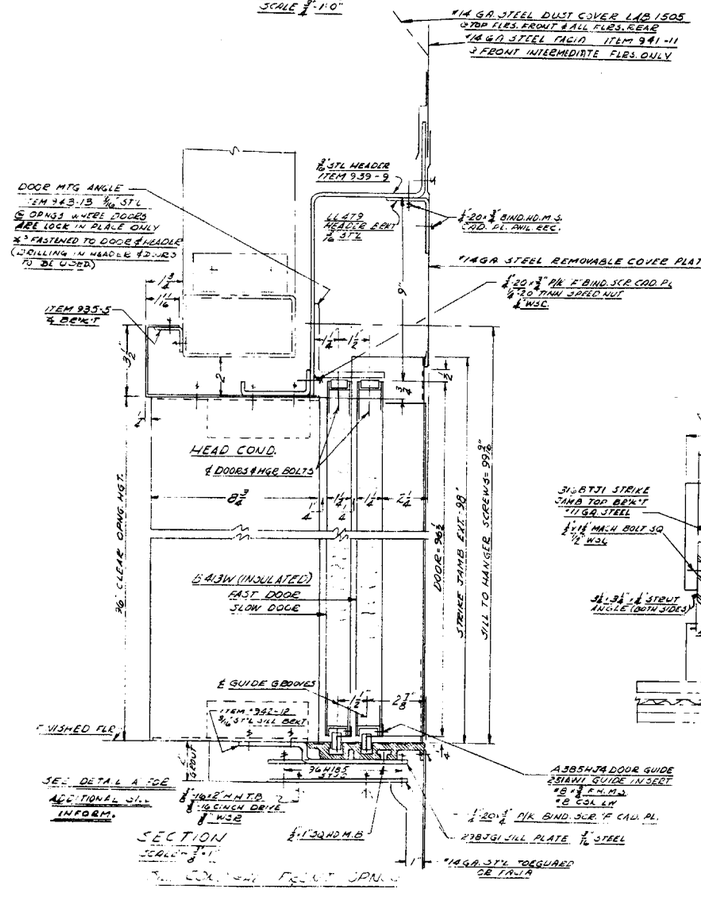
NOTE:

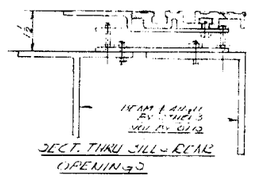
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 57-6410E.

Figure 8-25. Rear Car Door Magnetic Interlock Assembly

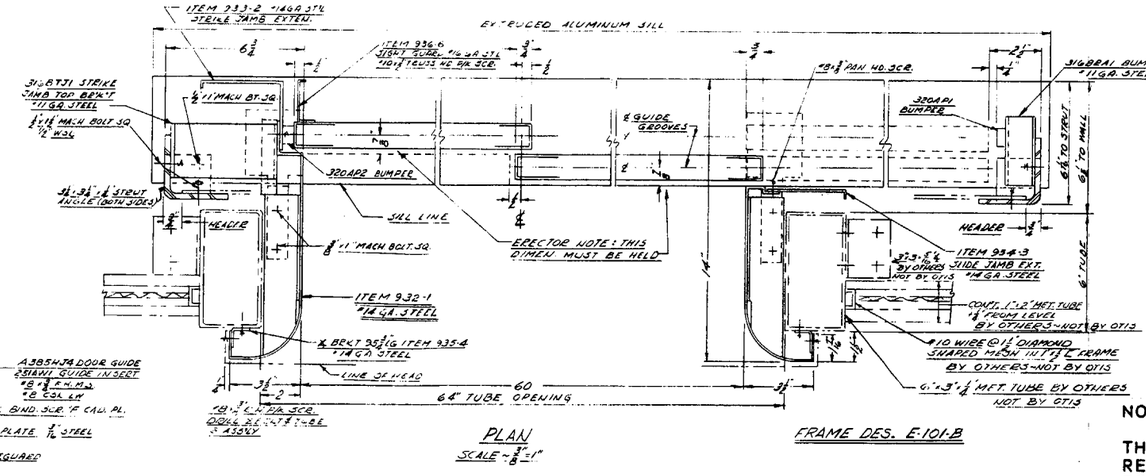


ELEVATION
SCALE 3/8"-1'-0"


#14 GA. STEEL DUST COVER LAB 1505 @ TOP FLRS. FRONT & ALL FLRS. REAR
#16 G/G STEEL FACIA ITEM 941-11 @ FRONT INTERMEDIATE FLRS. ONLY
DOOR MTG ANGLE
ITEM 943-13 3/16" ST'L
@ OPNGS WHERE DOORS ARE LOCK IN PLACE ONLY
* FASTENED TO DOOR & HEADER (DRILLING IN HEADER TO BE USED)
3/8" STL HEADER ITEM 939-9
LL479 HEADER BRKT 3/16" ST'L
3/4"-20 x 3/4" BIND. HD. M.S. CAD. PL. PAN. REC.
#14GA STEEL REMOVABLE COVER PLATES
3/4"-20 x 3/4" PAN F. BIND. SCR. CAD. PL. 3/4" PANL SPEED NUT #WSC
ITEM 935-5 3/16" ST'L
HEAD COND.
4 DOOR & HGR BOLTS
B413W (INSULATED) FAST DOOR SLOW DOOR
E GUIDE GROOVES
ITEM 932-12 3/16" ST'L SILL BRKT
FINISHED FLR
SEE DETAIL A FOR ADDITIONAL SILL INFORM.
3/16" ST'L 3/16" ST'L
5/16"-18 NC-2 HEX HD. BOLT #W32
1/2"-13 NC-2 HEX NUT
A385HJ4 DOOR GUIDE (STAKE GUIDE IN INSERT #16 GA. ST'L
1/2"-20 x 1/4" PAN HD. SCR. "F" CAD. PL.
298JG1 SILL PLATE 1/8" STEEL
#14GA. ST'L "TOEGUARD OR FACIA
DOOR-96"
STRIKE JAMB EXT. 98"
SILL TO HANGER SCREWS-99 1/8"
96" CLEAR OPNG. NOT.
SECTION
SCALE 3/8"-1'



HARDWARE SHOWN ON BODY NOT INCLUDED IN MATERIAL LIST


ITEM 933-2 #14GA ST'L STRIKE JAMB EXTEN.
EXTRUDED ALUMINUM SILL
ITEM 936-6 LIGHT GUIDE #16 GA ST'L #10-32 TRUSS HD SCR.
3/16 BTJ1 STRIKE JAMB TOP BRKT #11 GA STEEL
1/4"-20 MACH BOLT SQ 1/2" HEX
4 1/4"-20 x 1/2" STRUT ANGLE (BOTH SIDES)
320AP2 BUMPER
SILL LINE
HEADER
1/2" MACH BOLT SQ.
ITEM 932-1 #14 GA. STEEL
X BRKT 3/16 ITEM 935-4 #14 GA STEEL
LINE OF HEAD
64" TUBE OPENING
19-3/4" C'N PAN SCR. @ ALL 2'-1" & 4'-0" C'N & ASSY
PLAN
SCALE 3/8"-1'
3/16 BRA1 BUMPER BRKT #11 GA. STEEL
19-3/8" PAN HD. SCR.
320AP1 BUMPER
E GUIDE GROOVES
6 1/4" TO STRUT
6 1/8" TO WALL
6" TUBE
HEADER
ITEM 934-3 SIDE JAMB EXT. #14GA. STEEL
CONTG. 1-1/2" SQ. MET. TUBE 4' FROM LEVEL BY OTHERS-NOT BY OTIS
#10 WIRE 6" DIAMOND SHAPED MESH IN 1" SQ. FRAME BY OTHERS-NOT BY OTIS
6'-3" MET. TUBE BY OTHERS NOT BY OTIS
FRAME DES. E-101-B

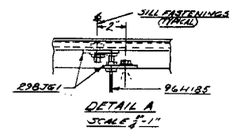
LEFT HAND - AS SHOWN
RIGHT HAND - OPPOSITE

LIST OF MATERIAL —— QUANTITIES FOR ONE

PC NO	NAME	NO REQD	MATERIAL	MATL SPEC COM'L	MATL SPEC OTIS	CONTRACTOR DWG NO	CONTRACTOR SERVICE PART NO	MANUFACTURER NAME	MANUFACTURER SERVICE PART NO	UNIT WT LB	REMARKS
ITEM 932-1	FRAME	1 RH ~ 1 LH	STEEL	SHEET STEEL ROLLED STRETCHER LEVELED	STEEL SPEC. #12	932	1				
ITEM 933-2	STRIKE JAMB EXT.	1 RH ~ 1 LH				933	2				
ITEM 934-3	SLIDE JAMB EXT.	2 R.H.				934	3				
ITEM 935-4	& BR'KT	6 R.H.				935	4				
ITEM 935-5		3 R.H.				935	5				
B413W	FAST DOOR	16" LH ~ 16" RH				B413W	B413W				FAST DOOR
B413W	SLOW DOOR	16" LH ~ 16" RH				B413W	B413W				SLOW DOOR
ITEM 936-6	SIGHT GUARD	3 L.H.				936	6				
A385HJ4	DOOR GUIDE	6 R.H.				A385HJ4	A385HJ4				
ITEM 937-7	MAIN COVER	16" LH ~ 16" RH			STEEL SPEC. #41A	937	7				
ITEM 938-8	SIDE COVER	16" LH ~ 16" RH				938	8				
LAB 1505	DUST COVER	100				LAB	1505				
LAB 1507	TOE GUARD	100				LAB	1507				
ITEM 941-11	FACIA	238				941	11				
316BTJ1	TOP BRACKET	3 L.H.				316BTJ	316BTJ1				
316BRA1	BUMPER BR'KT	3 L.H.		A1S1-C1015		316BEA	316BRA1				
LL479	HEADER BRKT	1002				LAC403	LL479				
298JG1	SILL PLATE	238 L.H.				298JG	298JG1				
ITEM 942-12	SILL BRACKET	6 R.H.				942	12				
ITEM 939-9	HEADER	1 RH ~ 1 LH				939	9				
ITEM 940-10	STRUT ANGLE	6 R.H.				940	10				
320AP1	BUMPER	3 L.H.	RUBBER	——	RUBBER SPEC. #1	320AP	320AP1				
320AP2		3 L.H.					320AP2				
A4264F3	EXTRUDED SILL	238 L.H.	ALUMINUM	6062-T6		A426AF	A4264F3				
251AW1	SLIDE INSERT	6 R.H.	PHENOLIC	——	OTIS SPEC. PHENOLIC #13	251AW	251AW1				
ITEM 943-13	DOOR MTG ANGLE	1 L.H.	STEEL	A1S1-C1015	STEEL #11A	943	13				FOR DOOR LOCKED IN PLACE ONLY

HOISTWAY DOORS				
FRONT OPNGS-FIXED LEVELS REAR OPNGS-MOVEABLE PLATFORM				
ELEV. NO	HAND	QTY	FLRS.	CONT. NO.
4 FRONT	L.H.	18	1,2,3,5,6,7,9,10,11,15,16,20,	301038
3 FRONT*	R.H.	18	22,25,28,31,32,34	
4 REAR	R.H.	3	LEVELS 0'-0", 24'-6"	
3 REAR *	L.H.	3	46'-9"	
5 FRONT	R.H.	18	1,2,3,5,6,7,9,10,11,15,16,20	301039
6 FRONT*	L.H.	18	22,25,28,31,32,34	
5 REAR	L.H.	3	LEVELS 0'-0" 34'-1", 46'-9"	
6 REAR *	R.H.	3		
9 FRONT	L.H.	20	1 THRU 7, 9, 10, 13, 14, 16, 19	301040
10 FRONT	R.H.	20	20, 22, 25, 27, 28, 31, 34	301041
9 REAR	R.H.	7	LEVELS 0'-0", 24'-6", 46'-9"	301040
10 REAR	L.H.	7	10'-0", 28'-3", 30'-9", 34'-3"	301041
11 FRONT	L.H.	25	1,2,3,5,6,7,9,10,11,13	301042
12 FRONT	R.H.	25	14,15,16,19,20,22	301043
13 FRONT	L.H.	25	24 TO 28, 30, 31, 32, 34	301044
14 FRONT	R.H.	25		301045
11 REAR	R.H.	8	LEVELS 0'-0", 34'-1",	301042
12 REAR	L.H.	8	46'-9" 10'-0", 16'-10", 28'-3", 30'-9", 34'-3"	301043
13 REAR	R.H.	8	LEVELS 0'-0", 24'-6",	301044
14 REAR	L.H.	8	46'-9" 10'-0", 16'-10", 28'-3", 30'-9", 34'-3"	301045
15 FRONT	L.H.	19	1,2,3,5,7,9,10,13,14,16	301046
16 FRONT*	R.H.	19	19,20,22,25,27,28,31,32,34	
15 REAR	R.H.	8	LEVELS 0'-0", 34'-1", 46'-9" 10'-0", 28'-3", 30'-9", 34'-3"	
16 REAR *	L.H.	8		
	L.H.	5	SPARE ENTRANCE	
	R.H.	5	SPARE ENTRANCE	

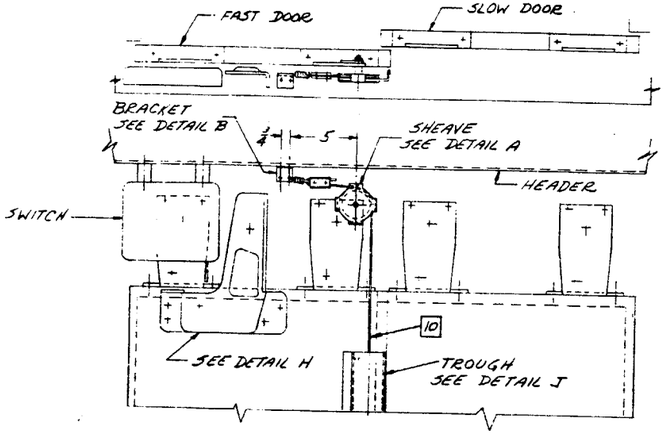
* HOISTWAY DOORS LOCKED IN PLACE

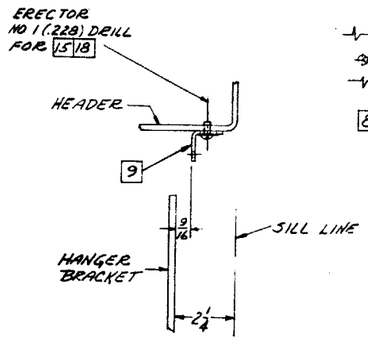


NOTE:

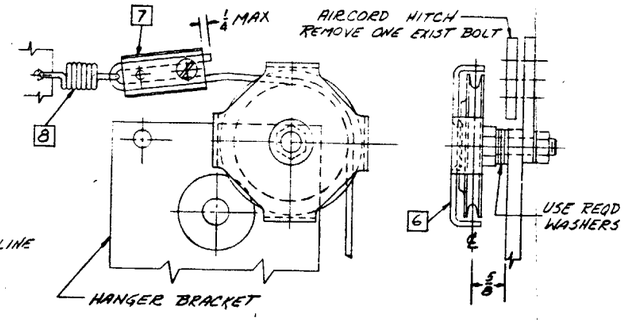
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING ZD-27117-932.

Figure 8-26. Hoistway Entrances and doors

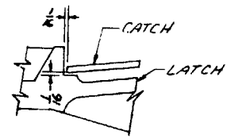




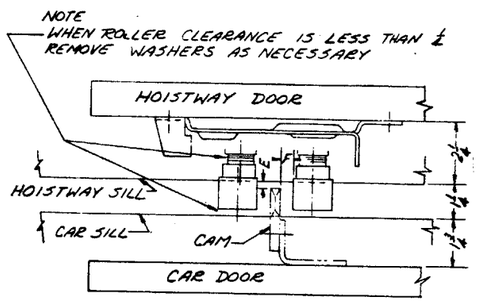
DETAIL B

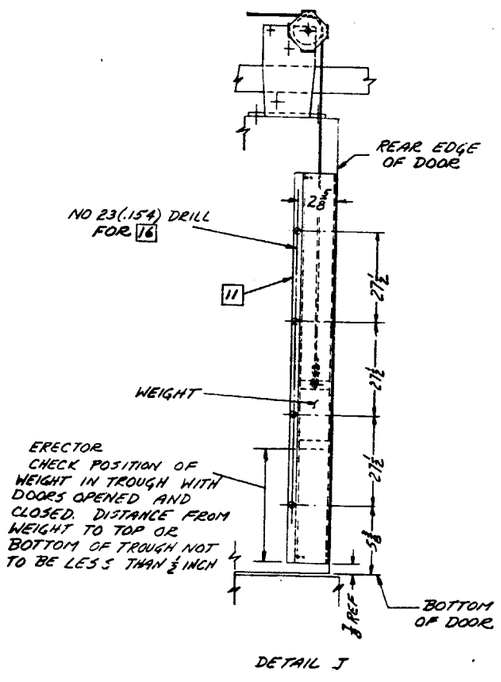


DETAIL A
MOUNTING OF SHEAVE

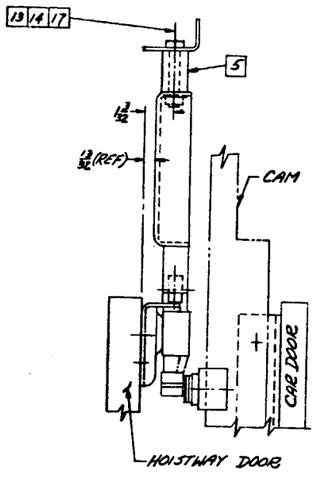


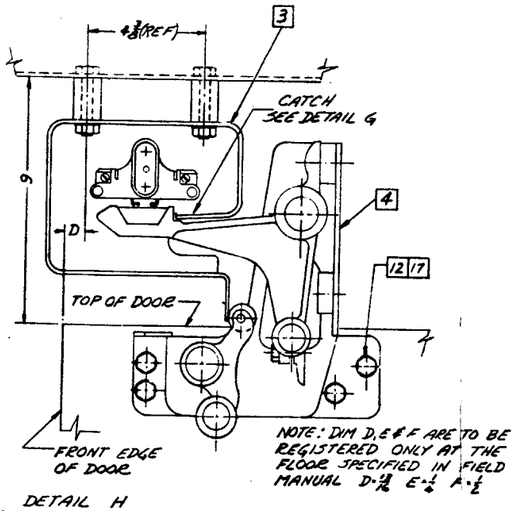
DETAIL G




REAR EDGE OF DOOR
2 5/8
NO 23 (.154) DRILL FOR 16
11
27 1/2
WEIGHT
ERECTOR CHECK POSITION OF WEIGHT IN TROUGH WITH DOORS OPENED AND CLOSED. DISTANCE FROM WEIGHT TO TOP OR BOTTOM OF TROUGH NOT TO BE LESS THAN 1/2 INCH
5/8
1/8 REF
BOTTOM OF DOOR

DETAIL J




4 3/8 (REF)
3
CATCH SEE DETAIL G
9
D
4
12 17
TOP OF DOOR
FRONT EDGE OF DOOR
NOTE: DIM D, E & F ARE TO BE REGISTERED ONLY AT THE FLOOR SPECIFIED IN FIELD MANUAL D-13/16 E-1/4 A-1/2

DETAIL H
MOUNTING OF INTERLOCK

1 ARRANGEMENT FOR RIGHT HAND OPERATOR
2 ARRANGEMENT FOR LEFT HAND OPERATOR

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-813, SHEET 1.

Figure 8-27. Hoistway Door Interlock (Sheet 1 of 2)

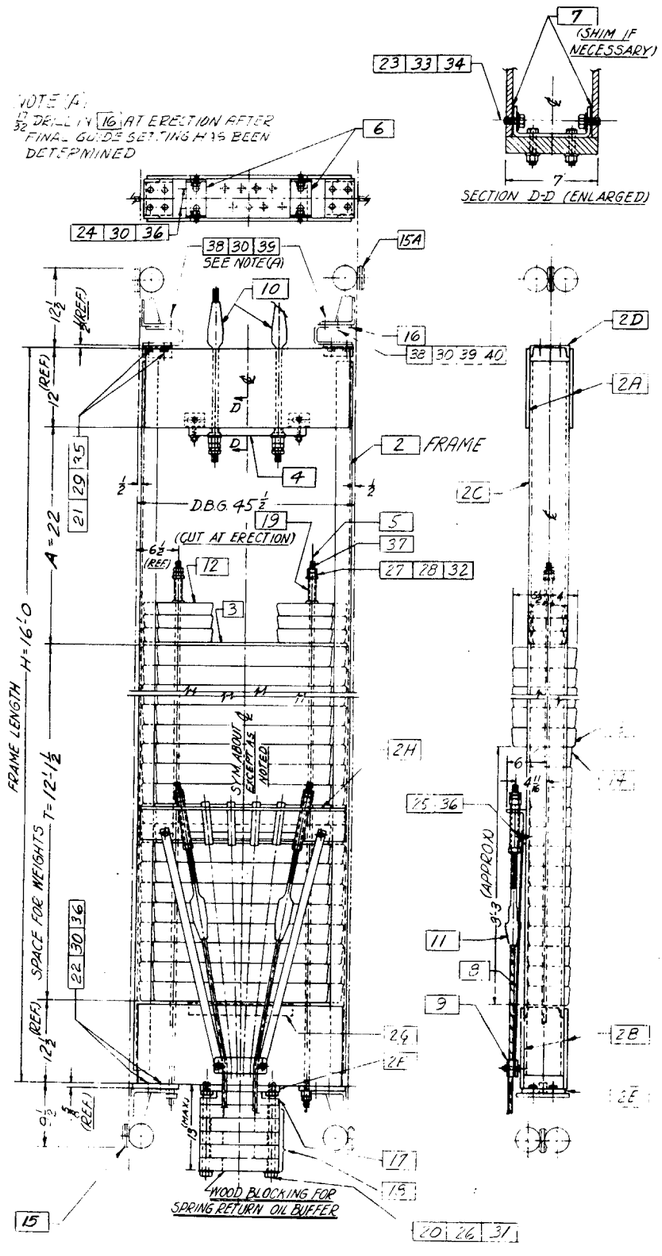
LIST OF MATERIAL —— QUANTITIES FOR ONE HOISTWAY DOOR OPENING

PC NO	NAME	NO REQD [7]	NO REQD [8]	MATERIAL	MATL SPEC COML	MATL SPEC OTIS	CONTRACTOR DWG NO	CONTRACTOR SERVICE MANUAL NO	MANUFACTURER NAME	MANUFACTURER SERVICE MANUAL OR DWG NO	UNIT WT LB	REMARKS
1	ARR FOR R.H. OPER	1					301038	ARR [7]				
2	ARR FOR L.H. OPER		1				-813	ARR [8]				
3	SWITCH	1					694L46	ARR 1				
			1					ARR 2				
4	DOOR LOCK	1					A6940C	ARR 1				
			1					ARR 2				
5	SPACER	2	2	STEEL		SPEC NO 10	462NA	462NA69				
6	SHEAVE ASSEM	1	1				265BD	265BD3				
7	CLAMP	1	1	STEEL			336GG	336G41	WILLSON PRODUCTS & CO.	CAT No 3871		
8	SPRING	1	1	SPRING STEEL		SPEC NO 1	918	91817				
9	BRACKET	1	1	STEEL		SPEC NO 41A	283FC	283FC1				
10	CABLE & WEIGHT	1	1				694OAD	ARR 4				WITH CABLE 174A52
11	THROUGH	1	1	STEEL		SPEC NO 115	301038-814					
12	3/8 - 1/4 FIN BOLT	4	4									
13	3/8 x 2 1/4 FIN BOLT	2	2									
14	3/8 FIN NUT	2	2				COML					
15	1/4-20 x 3/8 BIND F SCR	2	2	STEEL								
16	NO 10 x 1/2 TRUSS Z SCR	4	4									
17	3/8 INT EXT LW	6	6				130J	130J4	SHAKE-PROOF	4020-26-01		
18	1/4 INT EXT LW	2	2				130J	130J3	L.W. Co.	4014-26-00		

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-813, SHEET 2.

Figure 8-27. Hoistway Door Interlock (Sheet 2 of 2)



1 CWT ASSEMBLY

LIST OF MATERIAL —— QUANTITIES FOR ONE CWT ASSEMBLY

PC. NO.	NAME	NO. REQ'D PCI	MATERIAL	MATL. SPEC. GOVT	MATL. SPEC. COML	MATL. SPEC. OTIS	CONTRACTOR DWG. NO	CONTRACTOR PART NO.	MANUFACTURER NAME	MANUFACTURER DRAWING NUMBER OR PART NO.	UNIT WT. LBS.	REMARKS
1	CWT ASSEMBLY	1					301038-742	1				SEE NOTE 2
2	FRAME WELDMENT CONSISTING OF	1					374MP	ARR.15				
2A	TOP PLATE	2	STEEL		ASTM-A36	SPEC. 2	386CE	386CE42				
2B	BOTTOM PLATE	2					386SG	386SG41				
2C	LIPRIGHT 6.12.0 LB SHP CHANNEL	2				SPEC. 9	374MP					L=15'-8
2D	TOP GUIDE SHOE CHANNEL	2					333MT	333MT7				
2E	BOTTOM GUIDE SHOE PLATE	2			AISI-M1020	SPEC. 2	386MF	386MF9				
2F	BUFFER PLATE	1					386CE	386CE34				
2G	CHANNEL	1			ASTM-A36	SPEC. 9	333VN	333VN1				
2H	COMPENSATING ROPE HITCH	1					392AY	392AY3				SEE NOTE 1
3	TIE BAR	1			AISI-M1020	SPEC. 2	299AAE	299AAE4				
4	HITCH PLATE	1					386AM	386AM1				
5	3/4 DIA TIE ROD	2			AISI-C1018		596P					LENGTH(B)=14'-6
6	CHANNEL, FORMED	2			AISI-M1020		347BA	347BA1				
7	SHIM	8			COML		255AB	255AB19				
8	STIFF	2			ASTM-A303	SPEC.4IA	298CA	298CA11				
9	ROPE CLAMP	1					6055CJ	6055CJ7				
10	THIMBLE	8			AISI-C1035	SPEC.13	229D	229D7				
11	ROD	6						229D8				
12	ADJUSTMENT WEIGHT	BY ZONE	CAST IRON				BY ZONE					QUANTITIES BY ZONE
13	OFFSET WEIGHT											
14	BOTTOM WEIGHT											
15		2					B626A	APP.N°2				
15A	3/4 DIA ROLLER GUIDE	2						APP.N°5				
16	BRACKET	2	STEEL		AISI-M1020	N°2	316ABE	316ABE1				
17	WOOD BLOCK	1	MAPLE				310DH	310DH2				
18		5					310DF	310DF2				
19	3/4 x 24 STD PIPE	2	BLACK STEEL		COML							
20	1 INCH FIN BOLT	2					58XA	58XA192				
21	3/4 x 12 FIN BOLT	1	STEEL									
22	3/4 x 1 1/2 FIN BOLT	8										
23	3/4 x 1 FIN BOLT	4										
24	3/4 x 2 1/2 FIN BOLT	4										
25	3/4 x 3 FIN BOLT	2										
26	1 INCH FIN JAM NUT	6										
27	3/4 FIN JAM NUT	4										
28	3/4 FIN NUT	4										
29	5/8 FIN NUT	5										
30	1/2 FIN NUT	20										
31	1 INCH WASHER	2										
32	3/4 WASHER	4										
33	3/8 SAE WASHER	1										
34	3/4 EXT LW	4										
35	5/8 SPRING LW	16										
36	3/4 SPRING LW	14										
37	3/16 x 1 1/4 COTTER PIN	4										
38	1/2 x 2 FIN BOLT	2	STEEL		COML		12TAD	12TAL10				
39	1/2 FIN JAM NUT	4						12TAD8				
40	1/2 SAE WASHER	4										

NOTE 1

ROPE COMPENSATION HITCH ANGLE CONSISTS OF
(1) ANGLE, STEEL - OTIS SPEC NO 9 (COML SPEC ASTM-A36)
(6) 1 INCH STD STEEL PIPE (COML SPEC ASTM-A53)
(1) BAR, STEEL - OTIS SPEC NO2 (COML SPEC M1020)

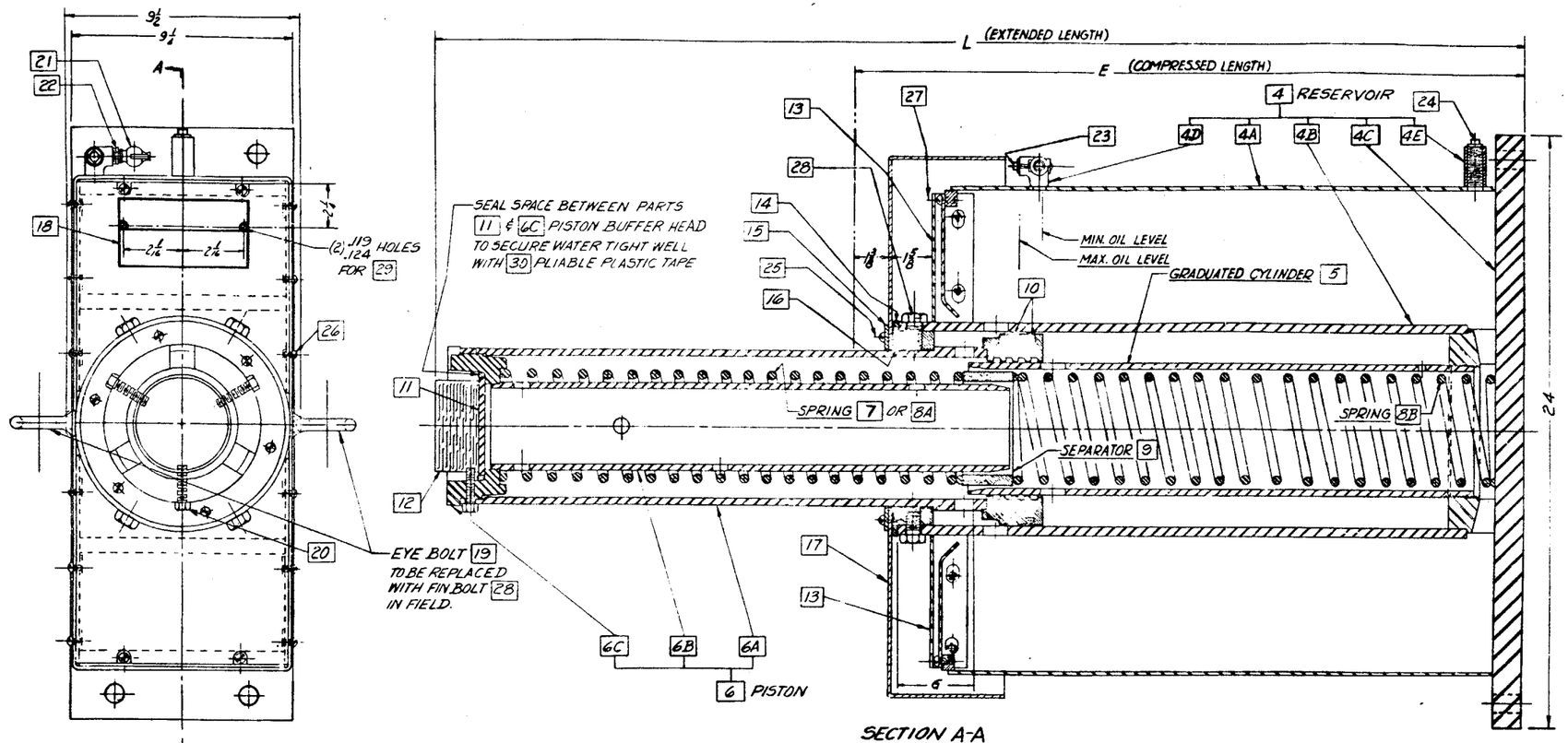
NOTE 2

COUNTERWEIGHT ASSEMBLY CONFORMS TO ASSEMBLY PER ARRANGEMENT NO 8 OF OTIS DWG NO 6055CE

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-742.

Figure 8-28. Counterweight



PC NO	STROKE	L	E	G	GRADUATED CYLINDER	CONTRACT NO	CAR OR CWT
1	9 1/4	28 1/8	18 3/8	1 1/2	350AF2	301047-50	CAR & CWT
2	33 1/2	81 7/8	47 3/8	6 1/4	350AF19	301038-46	CAR
3	33 1/2	81 7/8	47 3/8	6 1/4	350AF17		CWT

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-738, SHEET 1.

Figure 8-29. Oil Buffers (Sheet 1 of 2)

NOTES:

1) FOR PURCHASED PARTS THE EQUIVALENT OF THOSE IN THE LIST OF MATERIALS CAN BE USED.

2) PC NO. 6A WHICH IS EITHER OTIS PART NO. 442H1 OR 442H5 CONSISTS OF 6 INCH EXTRA STRONG PIPE, OTIS STEEL SPEC NO. 117 – COML SPEC ASTM A53, GR A OR B AND PART NO. 390AA1 WHICH IS OTIS CAST IRON SPEC NO. 30 – COML SPEC ASTM A48, CL 30B

3) 9 1/4 INCH STROKE BUFFER ASSEMBLY PC [1] CONFORMS TO ASSEMBLY PER ARR NO. 1 (TYPE A) OF OTIS DWG NO. A6136D. 33 1/2 INCH STROKE BUFFER ASSEMBLY PCS [2] & [3] CONFORM TO ASSEMBLY PER ARR NO. 5 (TYPE A) OF OTIS DWG NO. A6136D.

TABLE (A) FOR (1) PC NO. 4B

WELDMENT OTIS PART NO.	CYLINDER					BASE				
	OTIS PART NO.	QUANTITY	MATL	COML SPEC	OTIS SPEC	OTIS PART NO.	QUANTITY	MATL	COML SPEC	OTIS SPEC
350AE1	350AR1	1	STEEL	ASTM A53	NO. 118	172FT1	1	CAST STEEL	ASTM A27 GR 70-36	NO. 1
350AE5	350AR5	1					1			

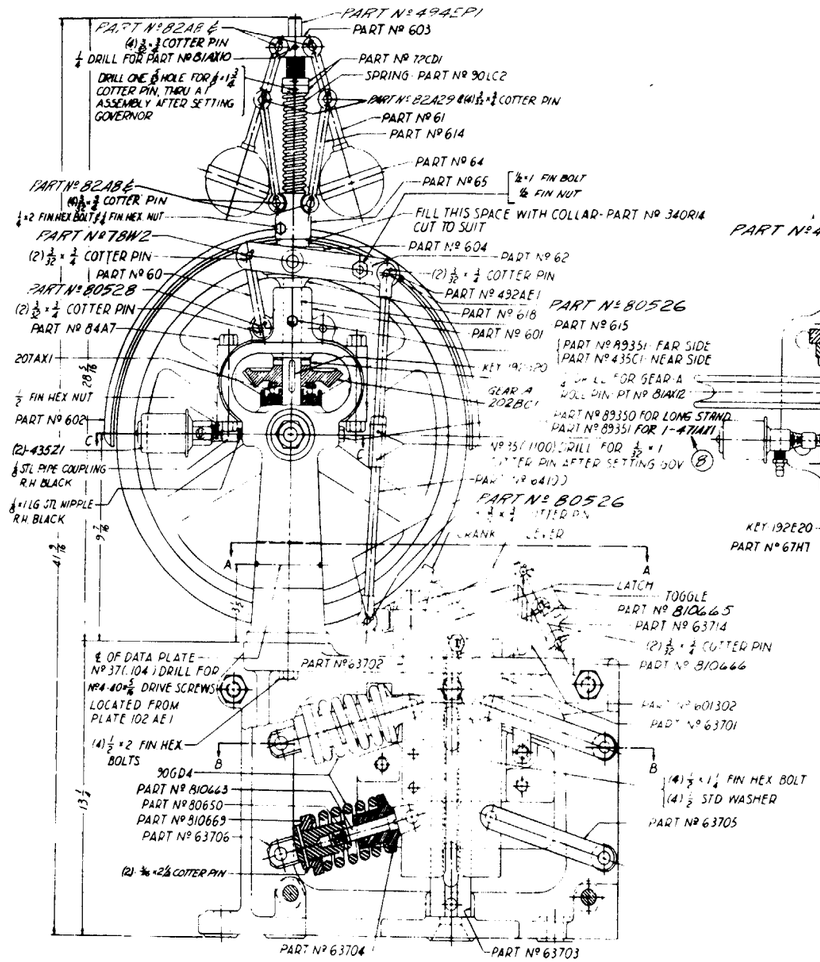
LIST OF MATERIAL — QUANTITIES FOR ONE — OIL BUFFER ASSEMBLY

PC NO	NAME	NO REQD PC MKR	NO REQD 2	NO REQD 3	MATERIAL	GOV'T	MATL SPEC COML	MATL SPEC OTIS	CONTRACTOR DWG NO	CONTRACTOR PART NO	MANUFACTURER NAME	MANUFACTURER CODE	UNIT WT LBS	REMARKS
1	9 1/4 INCH STROKE OIL BUFFER ASSEMBLY	X							301038-738 (SEE NOTE 3)	1				(1) REQD FOR CAR & (1) FOR CWT.
2	33 1/2 INCH STROKE OIL BUFFER ASSEMBLY		X							2				(2) REQD FOR CAR.
3	33 1/2 INCH STROKE OIL BUFFER ASSEMBLY			X						3				(1) REQD FOR CWT.
4	RESERVOIR CONSISTING OF	1							508R	508R1				
			1	1						508R5				
	4A HOUSING	1			STEEL		ASTM A415	SPEC NO 41A	396CN	396CN1				
			1	1						396CN5				
	4B OUTER CYLINDER	1			SEE TABLE (A)			SEE TABLE (A)	350AE	350AE1				QUANTITIES GIVEN ARE THOSE REQD TO MAKE ONE PC [4]
			1	1						350AE5				
	4C BASE PLATE	1	1	1	STEEL		ASTM A7 BLDG OR A36	SPEC NO 2	105BT	105BT1				
	4D 1/2 INCH SIDE OUTLET ELBOW	1	1	1	MALLEABLE IRON		ASA B16.3		396CN					
	4E 3/8 INCH PIPE COUPLING	1	1	1										
5	GRADUATED CYLINDER	1			STEEL		ASTM A53 GR B	SPEC NO 118	350AF	350AF2				
			1							350AF5				
				1						350AF7				
6	PISTON CONSISTING OF	1							442AA	442AA1				
			1	1						442AA5				
	6A PISTON	1			SEE NOTE 2			SEE NOTE 2	442H	442H1				
			1	1						442H5				
	6B SPRING GUIDE	1			STEEL		ASTM A53		377AZ	377AZ1				QUANTITIES GIVEN ARE THOSE REQD TO MAKE ONE PC [6]
			1	1						377AZ5				
	6C BUFFER HEAD	1	1	1	CAST STEEL		ASTM A27 GR 70-36	SPEC NO 1	390Y	390Y1				
7		1												
8A	SPRING		1	1	STEEL		ASTM A229 OR A68	SPRING SPEC NO 3 OR 4	90FD	90FD16				
8B			1	1						90FD18				
										90FD18				
9	SEPARATOR		1	1			MT 1015	SPEC NO 69	464AG	464AG1				
10	RING	2	2	2	CAST IRON		ASTM A48		172EW	172EW1	KOPPERS CO. INC.	5-32021		
11	DISK	1	1	1	STEEL		AISI M1020	SPEC NO 2	353AB	353AB9				
12	BUMPER	1	1	1	RUBBER		—	SPEC NO 3	320E	320E2				
13	COVER	2	2	2	STEEL		ASTM A415	SPEC NO 41A	346SL	346SL1				
14	HEAD, CYLINDER	1	1	1	BRONZE		ASTM B145	SPEC NO 2	A390Z	A390Z2				
15	COVER	1	1	1	STEEL		ASTM A415	SPEC NO 41A	346PV	346PV1				
16	SEAL	1	1	1			—		33J	33J2	GARLOCK PACKING COMPANY	237		
17	COVER, CANVAS	1	1	1	DANDUX NO 22		—		346AEJ	346AEJT	C.R. DANIELS INC.			
18	PLATE, NAME	1	1	1			—		BWRBD	BWRBDN				
19	EYE BOLT	2	2	2	STEEL		ASTM A235	SPEC NO 2	57A	57A2				
20	BOLT	3	3	3			ASA B18.2		58XA	58XA6				
21	1/4 INCH PET COCK	1	1	1	BRASS		—				CRANE	NO 700		
22	1/2 x 1/4 OUTSIDE HEXAGON BUSHING	1	1	1	MALLEABLE IRON		ASA B16.14							
23	1/2 INCH STD PIPE PLUG	1	1	1	IRON									
24	3/8 INCH STD PIPE PLUG	1	1	1										
25	NO 10-32 x 3/8 RD MACH SCR	6	6	6	STEEL		COML							
26	1/2-20 x 3/8 RD MACH SCR	12	12	12										
27	1/4-20 x 1/2 RD MACH SCR	4	4	4										
28	3/8 x 1 FIN BOLT	8	8	8										
29	NO 6 x 1/2 U SCR	2	2	2							PARKER KALON			
30	1/4 DIA PLIABLE PLASTIC TAPE	2 FT	2 FT	2 FT	PLASTIC		—				J.W. MORTELL CO.			

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-738, SHEET 2.

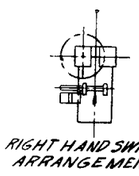
Figure 8-29. Oil Buffers (Sheet 2 of 2)

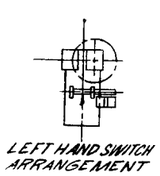


ARR. AS SHOWN IS FOR R. H. GOV. (EXCEPT SWITCH ARRANGEMENT SHOWN IN SECTION A-A WHICH INDICATES A L. H. GOV. SWITCH ARRANGEMENT)

NOTE:
FOR GOVERNOR ENCLOSURE SEE DWG 301038-311

CAR SPEED	700FPM
6098B SWITCH OPERATES AT	750FPM
A6098D SWITCH OPERATES AT	795FPM
GOV. TRIPS SPEED	840FPM





ARR. Nº	HAND OF GOV	LATCH	CRANK	TOGGLE	LEVER	BASE-A	BASE-B	LONG STAND	SPRING	SWITCH-Y	SWITCH-Z	BRACKET
1	RIGHT HAND	63726	63711	63713	63710	105BP3	105BP2	2-471TA1	92FB	6098D6	A6098B1	316BAL2
2	LEFT HAND	68976	68976	68979	68977	105BP6	105BP4	2-471TA2	92F7	6098D5	A6098B9	316BAL1

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-308, SHEET 1.

Figure 8-30. Governor Assembly (Sheet 1 of 4)

LIST OF MATERIAL — QUANTITIES FOR ONE *HA GOVERNOR*

ITEM OR FIND Nº	NAME	NO REQ'D RH	NO REQ'D LH	MATERIAL	MATL SPEC GOVT.	MATL SPEC COML	MATL SPEC OTIS	CONTRACTOR DWG NO	CONTRACTOR SERVICE PART NO	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO	UNIT WT LB	REMARKS
1	ASSEMBLY, HA GOV.	1	-					301038-308	1				
2	ASSEMBLY, HA GOV.	-	1						2				
67H7	NUT, LOCK.	1	1	STEEL				67H					
72CD1	NUTS, SPINDLE	2	2	STEEL		AISI C1018	10	72CD					
78W2	PIN	1	1					78W					
81AX10	PIN, ROLL	1	1	CARBON STEEL				81AX		ELASTIC STOP-NUT CORP.			
81AX12	PIN, ROLL	1	1										
81AX13	PIN, ROLL	1	1										
82A8	PINS	4	4	STEEL		AISI C1018	10	82A					
82A29	PINS	2	2										
84A7	BOLTS	2	2	STEEL				84A					
84A25	BOLTS	4	4										
90GD4	SPRINGS	2	2	STEEL				90GD					
90LC2	SPRING	1	1	STEEL WIRE				90LC					
92F7	SPRING	-	1	MUSIC WIRE				92E					
92F8	SPRING	1	-										
102AE1	PLATE, DATA	1	1	STEEL				102AE					
105BP2	PLATE, BASE	1	-	CAST IRON		ASTM A48 CLASS 20A	20	105BP					
105BP4	PLATE, BASE	-	1										
105BP5	PLATE, BASE	1	-										
105BP6	PATE, BASE	-	1										
128AF23	WASHER	1	1	BRASS				128AF					
128AF45	WASHER	1	1										
128AF51	WASHER	1	1										
192E20	KEY	1	1	STEEL		AISI C1018	18	192E					
192G20	KEY	1	1					192G					
202BB1	GEAR, BEVEL	1	1	CAST IRON		ASTM A48 CLASS 20A	20	202BB					
202BC1	GEAR, BEVEL	1	1					202BC					
207AX1	BEARINGS, BALL	2	2					207AX		MRC	MRC 1107-F		
288JA2	LEVER, OPERATING	1	1	CASTIRON		ASTM A48 CLASS 20A	20	288JA					
316BKL1	BRACKET	-	1	STEEL		AISI C1020	2	316BKL					
316BKL2	BRACKET	1	-										
327DD2	CAM	1	1	CASTIRON		ASTM A48 CASS 20A	20	327DD					
340R14	COLLAR	1	1	STEEL		AISI C1018	10	340R					
435C1	FITTING	1	1					435C		ALEMITE DIV. STEWART WARNER CO	1610-B		
(10) 435Z1	FITTING	2	2					435Z			1740-33		
1-471AX1	STAND, SHORT CONSISTING OF	1	1	CASTIRON		ASTM A48 CLASS 20A	20	1-471AX	← (9)				
—	SLEEVE, SHEAVE SHAFT	1	1	BRONZE			3	1-210F	1-210F2 ← (13)				
—	SCREWS	2	2	STEEL		AISI C1018	2	A-360V	89351				

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-308, SHEET 2.

Figure 8-30. Governor Assembly (Sheet 2 of 4)

LIST OF MATERIAL —— QUANTITIES FOR ONE *HA GOVERNOR*

ITEM OR FIND Nº	NAME	NO REQD R.H	NO REQD L.H	MATERIAL	MATL SPEC GOVT.	MATL SPEC COM'L	OTIS	CONTRACTOR DWG NO	CONTRACTOR SERVICE PART NO	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO	UNIT WT LB	REMARKS
2-471TA1	STAND, LONG CONSISTING OF	1	—	CAST IRON		ASTM A48 CLASS 20A	20	2-471TA	(11)				
—	SLEEVE, SPINDLE FOOT	1	—	BRONZE			3	A-360V	616				
—	SLEEVE, SHEAVE SHAFT	1	—					1-210F	1-210F1	(16)			
2-471TA2	STAND, LONG CONSISTING OF	—	1	CAST IRON		ASTM A48 CLASS 20A	20	2-471TA	(12)				
—	SLEEVE, SPINDLE FOOT	—	1	BRONZE			3	A-360V	616				
—	SLEEVE, SHEAVE SHAFT	—	1					1-210F	1-210F1	(17)			
492AE1	YOKE	1	1	STEEL		AISI C1020	2	492AE					
494Z7	SHAFT, OPERATING CAM	1	1	BRONZE			17	494Z					
494EP1	SPINDLE SHAFT	1	1	STEEL		AISI C1018	2	494EP					
495AM2	SHAFT CONSISTING OF	1	1					495AM					
—	SHEAVE	1	1	CAST IRON		ASTM A48 CLASS 20A	20	267B	267B1				
—	PIN, ROLL	1	1	CARBON STEEL				81AX	81AX9				
—	KEY	1	1	STEEL		AISI C1018	18	192G	192G31				
A6098B1	SWITCH ASSEMBLY	1	-					A6098B					
A6098B9	SWITCH ASSEMBLY	-	1										
6098D6	SWITCH ASSEMBLY	1	-					6098D					
6098D5	SWITCH ASSEMBLY	-	1										
60	ARM, FORK CONNECTING	1	1	BRONZE			1	A-14 GOV.					
61	ARMS, BALL	2	2										
62	FORK, SHORT SIDE	1	1	STEEL		AISI C1020	2	A-4 GOV.					
64	BALLS	2	2	CAST IRON		ASTM A48 CLASS 20A	20	A-14 GOV.					
65	CAP, SLIDING SLEEVE	1	1	BRONZE			3	A-3 GOV.					
602	GUARD, ROPE	1	1	CAST IRON		ASTM A48 CLASS 20A	20	15-C GOV.					
603	CROSSHEAD	1	1	BRONZE			1	A-14 GOV.					
604	CROSSHEAD, SLIDING	1	1	BRONZE			3	A-4 GOV.					
614	LINKS	2	2	BRONZE			1	A-14 GOV					
618	SLEEVE SLIDING CONSISTING OF	1	1					A-3 GOV.					
—	SLEEVE, SLIDING	1	1	BRONZE			3		6706				
—	TUBE	1	1	BRASS				T.C. 1356	81515				
6955	SPACERS	2	2	WROUGHT IRON				C-24 GOV.					
80526	PIN	2	2	STEEL		AISI C1018	10	15C GOV					
601	SPINDLE BEARING FRAME	1	1	CAST IRON		ASTM A48 CLASS 20A	20	2-GOV.					
615	SPINDLE SLEEVE	1	1	BRONZE			3	A-3 GOV.					
63701	JAW, ROPE GRIPPING	1	1	STEEL		AISI C1018	10	C-24 GOV.					
63702	JAW, ROPE GRIPPING	1	1										
63703	GUIDES, JAW	2	2										
63704	LINKS	2	2	CAST IRON		ASTM A48 CLASS 20A	20						
63705	LINKS, JAW	4	4	STEEL		AISI C1018	10						
63706	LINKS	2	2										

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-308, SHEET 3.

Figure 8-30. Governor Assembly (Sheet 3 of 4)

LIST OF MATERIAL —— QUANTITIES FOR ONE *HA GOVERNOR*

ITEM OR FIND Nº	NAME	NO REQ'D R.H.	NO REQ'D L.H.	MATERIAL	MATL SPEC GOVT	MATL SPEC COM'L	MATL SPEC OTIS	CONTRACTOR DWG NO	CONTRACTOR SERVICE PART NO	MANUFACTURER NAME	MANUFACTURER STOCK NUMBER OR DWG NO	UNIT WT LB	REMARKS
63707	WEIGHT, JAW-R.H.	1	1	CAST IRON		ASTM A48 CLASS 20A	20	A-25 GOV.					
63708	WEIGHT, JAW-L.H.	1	1										
63709	WEIGHTS, EXTRA	2	2										
63710	LEVER	1	-					A-26 GOV.					
63711	CRANK, TRIP	1	-										
63713	TOGGLE	1	-										
63714	TOGGLE	1	1										
63715	SPACER	1	1	SEAMLESS TUBE									
63726	LATCH	1	-	CAST IRON		ASTM A48 CLASS 20A	20	A-27 GOV.					
64100	ROD, CONNECTING	1	1										
——	ROD ENDS	2	2	MALLEABLE CAST IRON			3		64099				
——	TURNBUCKLE	1	1	STEEL		AISI C1018	10	15-C GOV.	81502				
——	NUT	1	1	STEEL				68A	68A5				
68976	LATCH	-	1	CAST IRON		ASTM A48 CLASS 20A	20	A-27 GOV.					
68977	LEVER	-	1					A-26 GOV.					
68978	CRANK, TRIP	-	1										
68979	TOGGLE	-	1										
80528	PIN	1	1	STEEL		AISI C1018	10	A-14 GOV					
80650	PINS-END RIVETED	2	2	STEEL		AISI C1018	2	4466-A-ED					
85267	WASHER	1	1	BRASS				T.C. 1127					
89350	SCREW	1	1	STEEL		AISI C1018	2	A-3 GOV.					
89351	SCREW, SLEEVE	2	2	STEEL			2	A3 GOV.					
601302	ROD	1	1	STEEL			10	C-24 GOV.					
807829	OILERS, FLUSH TYPE	3	3	STEEL						TUCKER	#51 STYLE "H"		
810660	PINS	2	2	BRONZE		TOBIN BRONZE	17	C-24 GOV					
810661	PINS	2	2										
810662	PINS	4	4										
810663	SCREWS	2	2	STEEL		AISI C1018	10						
810665	PINS, TOGGLE	2	2	BRONZE		TOBIN BRONZE	17	A-26 GOV.					
810666	PIN, TOGGLE	1	1										
810667	PIN, TOGGLE	1	1										
810669	NUT	2	2	CAST IRON		ASTM A48 CLASS 20A	20	C24 GOV.					
810681	PIN	1	1	BRONZE		TOBIN BRONZE	17	A-27 GOV.					

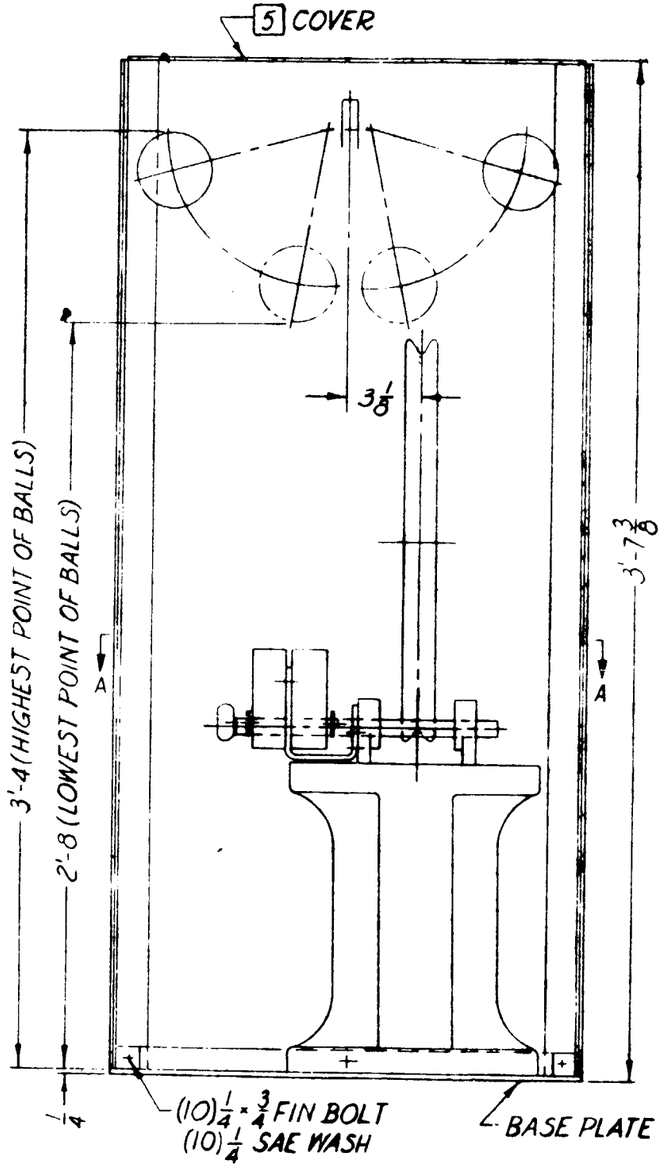
NOTE:

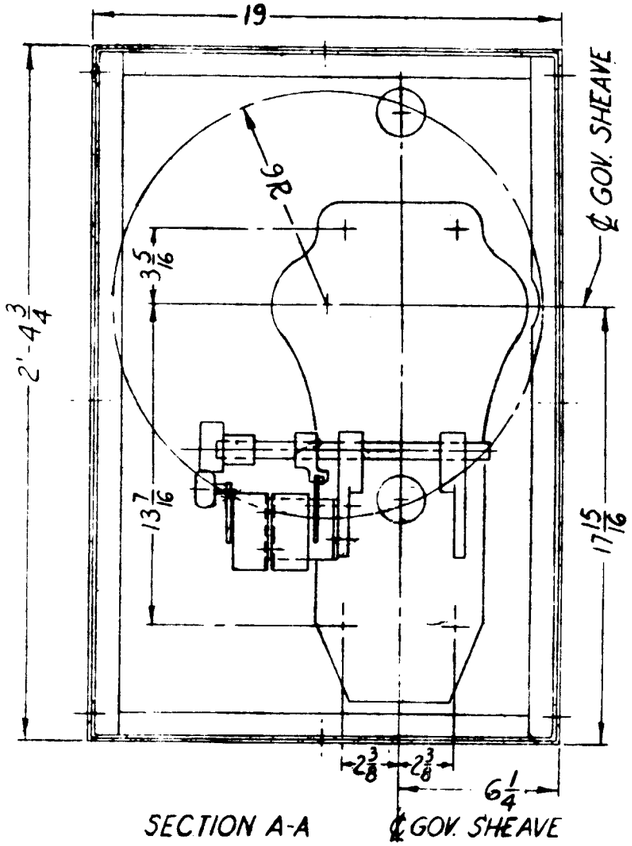
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-308, SHEET 4.

Figure 8-30. Governor Assembly (Sheet 4 of 4)

LIST OF MATERIAL —— QUANTITIES FOR ONE HA GOV. ENCLOSURE

ITEM OR FIND Nº	NAME	NO. REQ'D R.H.	NO. REQ'D L.H.	MATERIAL	MATL. SPEC GOVT.	MATL. SPEC COM'L.	MATL. SPEC OTIS	CONTRACTOR DWG. NO.	CONTRACTOR SERVICE PART NO.	MANUFACTURER NAME	MANUFACTURER SERVICE PART NO. OR ITEM NO.	UNIT WT LB	REMARKS
1	ASSEMBLY GOV. ENCLOSURE	1	—	STEEL									
2	ASSEMBLY GOV. ENCLOSURE	—	1										
3	BASE PLATE	1	—			A131.	2	301038-309	1				
4	BASE PLATE	—	1			C1020		301038-309	2				
5	COVER	1	1			ASTM-A415	41A	301038-310	1				



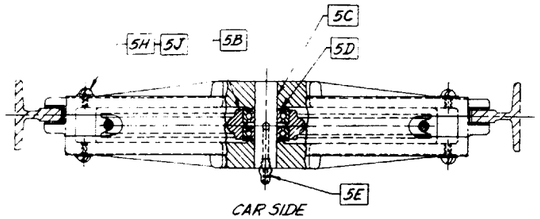


ARR. Nº	GOV. HAND	BASE PLATE
1	R.H.-AS SHOWN	3
2	L.H.-OPPOSITE	4

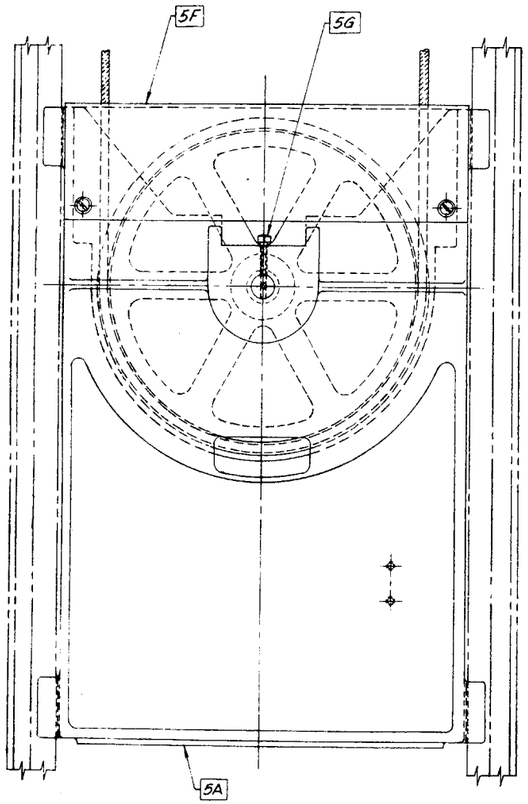
NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-311.

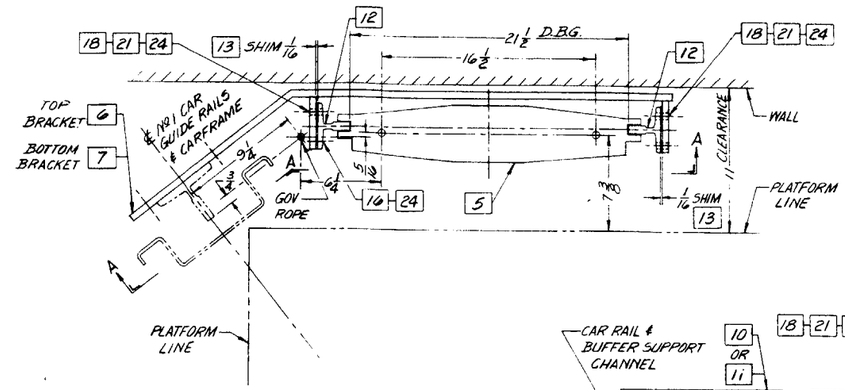
Figure 8-31. Governor Enclosure



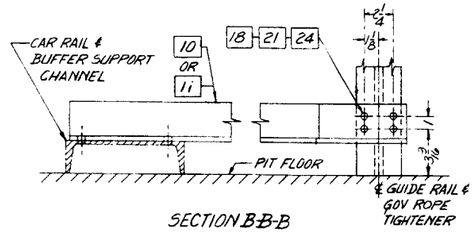
CAR SIDE
PLAN VIEW



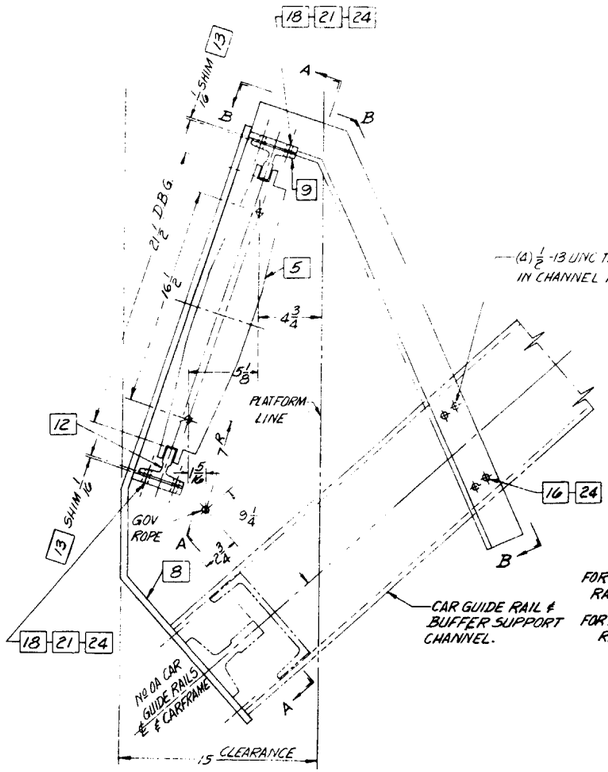
5 GOVERNOR SHEAVE & FRAME ASSEMBLY



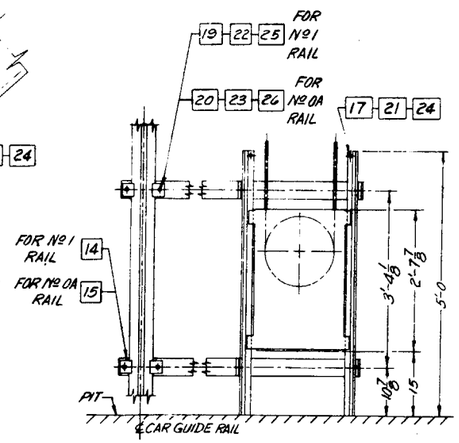
MOUNTING ARR 1 - AS SHOWN
FOR CONTRACT NOS 301047 & 301050
MOUNTING ARR 2 - OPPOSITE HAND
FOR CONTRACT NOS 301048 & 301049



SECTION B-B-B



MOUNTING ARR 3 - AS SHOWN
CONTRACT NOS 301039, 301040, 301042, 301044, 301046 & 302388
MOUNTING ARR 4 - OPPOSITE HAND
FOR CONTRACT NOS 301039, 301041, 301043, 301045 & 302386/87



VIEW A-A-A

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-732, SHEET 1.

Figure 8-32. Governor Rope Tightener (Sheet 1 of 2)

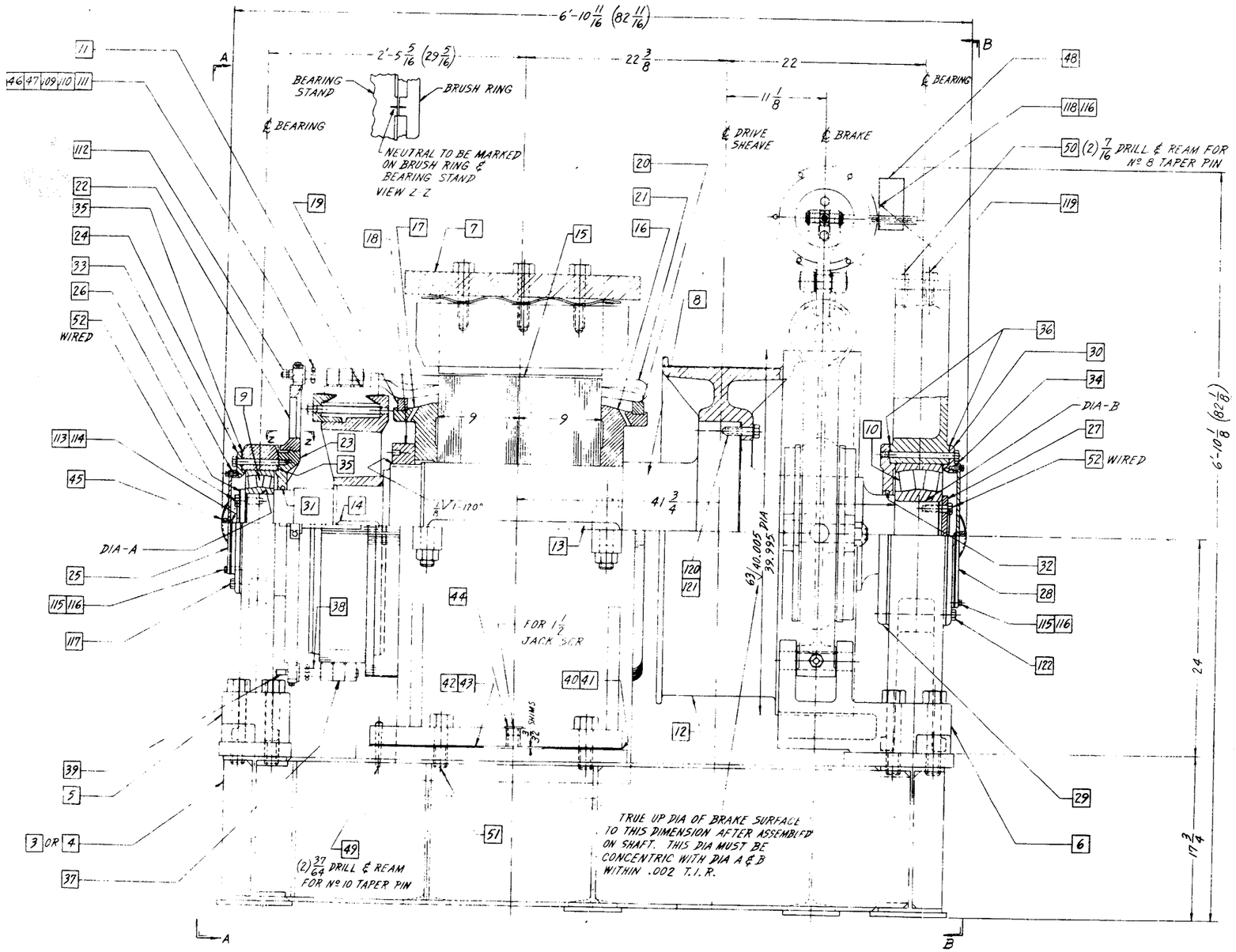
LIST OF MATERIAL ---------- QUANTITIES FOR ONE GOV. ROPE TIGHTENER MOUNTING ARR

PC NO	NAME	NO REQ'D ARR 1	ARR 2	ARR 3	ARR 4	MATERIAL	MATL SPEC GOVT	MATL SPEC COM'L	MATL SPEC OTIS	CONTRACTOR DWG NO	CONTRACTOR SERVICE PART NO	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR TYPE NO	UNIT WT LB	REMARKS
1	MOUNTING ARRANGEMENT	1								301038-732	1				
2	MOUNTING ARRANGEMENT		1								2				
3	MOUNTING ARRANGEMENT			1							3				
4	MOUNTING ARRANGEMENT				1						4				
5	GOV SHEAVE & FRAME ASSEMBLY CONSISTING OF	1	1	1	1						5				
5A	WEIGHT	1	1	1	1	CAST IRON		ASTM A48 CLASS 30B	Nº 30	A-1103-5A	GG713				
5B	SHEAVE	1	1	1	1	CAST IRON			Nº 30	265AD	265AD1				
5C	SHEAVE PIN	1	1	1	1	STEEL		AISI C1018	Nº 10	1101-5A	B1257T				
5D	BEARING	2	2	2	2	STEEL		———	———	207AF	207AF1	MARLIN ROCKWELL CORP.	MRC-206-MF		PURCHASED PART
5E	FITTING	1	1	1	1	STEEL		———	———	435C	435C1	ALEMITE CO.	1610-B		PURCHASED PART
5F	COVER	1	1	1	1	STEEL		ASTM A415	Nº 41A	1101-5A	GG056				
5G	1/2-13 x 1 3/4 SQ SET SCR CUP PT	1	1	1	1	STEEL		COM'L							
5H	3/8-16 x 1/2 RD MACH SCR	4	4	4	4	STEEL		COM'L							
5J	3/8 SAE WASHER	4	4	4	4	STEEL		COM'L							
6	TOP BRACKET	1	1			STEEL		AISI M1020	Nº 2	301038-733	330				
7	BOTTOM BRACKET	1	1			STEEL			Nº 2		331				
8	BRACKET			2	2	STEEL			Nº 2		332				
9	GUIDE RAIL			1	1	STEEL		———	Nº 56		333				
10	BRACE ANGLE			1		STEEL		ASTM A36	Nº 9		334				
11	BRACE ANGLE				1	STEEL			Nº 9		335				
12	GUIDE RAIL	2	2	1	1	STEEL		———	Nº 56	450AR	450AR1				
13	SHIM	8	8	8	8	STEEL		———	———	255J	255J1				
14	RAIL CLIP	4	4			STEEL		ASTM A235	Nº 2	339D	339D1				
15	RAIL CLIP			4	4	STEEL			Nº 2	339C	339C1				
16	1/2 x 1 FIN BOLT	1	1	4	4	STEEL		COM'L							
17	1/2 x 1 1/4 FIN BOLT	2	2	2	2	STEEL		COM'L							
18	1/2 x 1 3/4 FIN BOLT	7	7	12	12	STEEL		COM'L							
19	5/8 x 2 FIN BOLT	4	4			STEEL		COM'L							
20	5/8 x 2 FIN BOLT			4	4	STEEL		COM'L							
21	1/2 FIN NUT	9	9	14	14	STEEL		COM'L							
22	5/8 FIN NUT	4	4			STEEL		COM'L							
23	3/4 FIN NUT			4	4	STEEL		COM'L							
24	1/2 SPRING LW	10	10	18	18	STEEL		COM'L							
25	5/8 SPRING LW	4	4			STEEL		COM'L							
26	3/4 SPRING LW			4	4	STEEL		COM'L							

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-732, SHEET 2

Figure 8-32. Governor Rope Tightener (Sheet 2 of 2)


6'-10 11/16 (82 11/16)
2'-5 5/16 (29 5/16)
22 3/8
22
11 1/8
BEARING STAND
BRUSH RING
℄ BEARING
NEUTRAL TO BE MARKED ON BRUSH RING & BEARING STAND VIEW Z Z
℄ DRIVE SHEAVE
℄ BRAKE
℄ BEARING
50 (2) 7/16 DRILL & REAM FOR Nº 8 TAPER PIN
WIRED
DIA-A
DIA-B
41 3/4
40.005 39.995 DIA
FOR 1 1/2 JACK SCR
(2) 37/64 DRILL & REAM FOR Nº 10 TAPER PIN
TRUE UP DIA OF BRAKE SURFACE TO THIS DIMENSION AFTER ASSEMBLED ON SHAFT. THIS DIA MUST BE CONCENTRIC WITH DIA A & B WITHIN .002 T.I.R.
6'-10 1/8 (82 1/8)
24
17 3/4
A
B

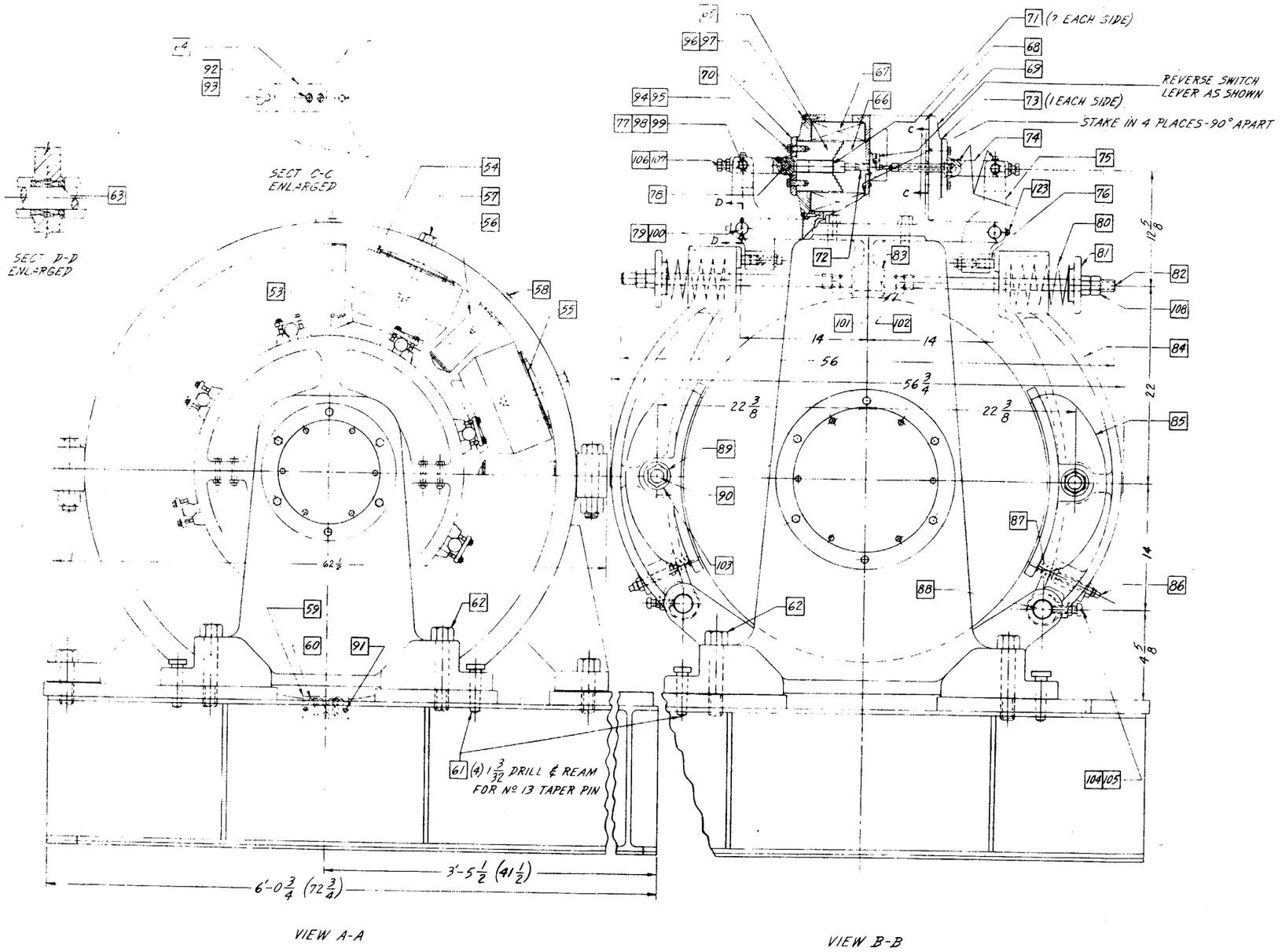
1 R.H. ARR. AS SHOWN
2 L.H. ARR. OPPOSITE

FOR VIEWS A-A & B-B
SEE DWG 301038-300 SH Nº 3

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-300, SHEET 1.

Figure 8-33. Machine Assembly (Sheet 1 of 3)



NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-300, SHEET 2.

Figure 8-33. Machine Assembly (Sheet 2 of 3)

LIST OF MATERIAL — QUANTITIES FOR ONE MACHINE

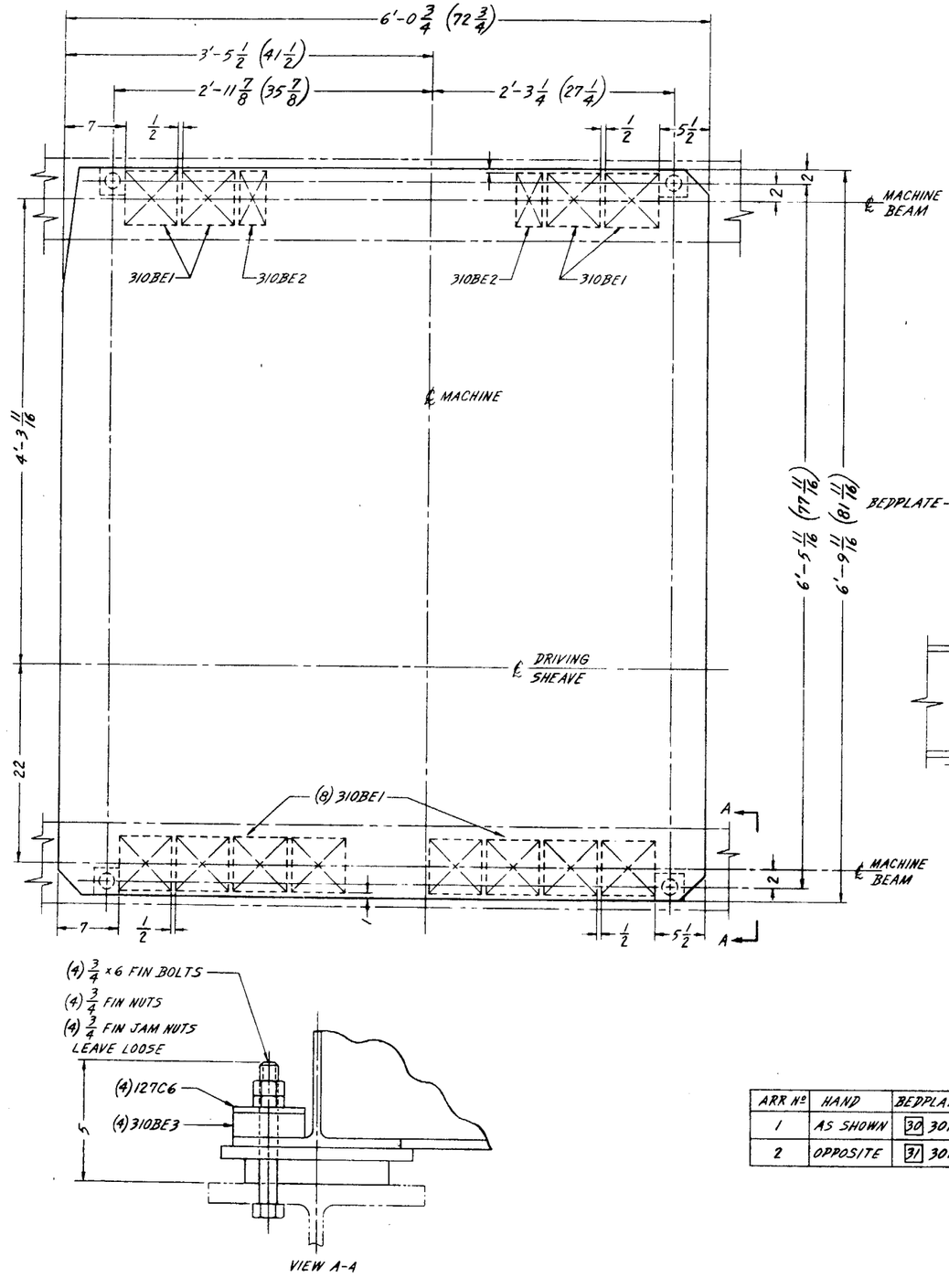
PC NO.	NAME	NO. REQ'D	MATERIAL	MAT'L SPEC COM'L	MAT'L SPEC OTIS	CONTRACTOR DWG NO	CONTRACTOR SERVICE PART NO.	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO.	REMARKS
1	ASSEMBLY R.H. MACH	—	—	—	—	301038 -300	1			
2	269 HT MACH L.H. MACH	—	—	—	—		2			
3	BEDPLATE R.H. MACH	1	STEEL	ASTM A7 OR A36	2 & 9	301038 -301	30			
4	BEDPLATE L.H. MACH	1	STEEL	ASTM A7 OR A36	2 & 9		31			
5	BEARING STAND, FRONT	1	CAST IRON	ASTM A48 CL 30B	30	1-472HA	1-472NA1			
6	BEARING STAND, REAR	1	CAST IRON	ASTM A48 CL 30B	30	2-472JA	2-472JA2			
7	FIELD FRAME	1	STEEL	AISI C1020	—	2-366BE	2-366BE1			
8	SHAFT	1	STEEL FORGING	AISI C1045	60	8-460R	8-460R1			
9	BEARING	1	STEEL	—	—	—	—	S.K.F.	22232C	
10	BEARING	1	STEEL	—	—	—	—	S.K.F.	22338C	
11	COMMUTATOR	1	—	—	—	1-703JB	—			
12	DRIVE SHEAVE	1	CAST IRON	ASTM A48	40M	1-690SH	1-690SH1			
13	KEY	1	STEEL	AISI C1018	18	7-192G	7-192G2			
14	KEY	1	STEEL	AISI C1018	18	7-192G	7-192G1			
15	ARMATURE LAMINATIONS	301		COML BLACK	41	2-423AF	2-423AF1			
16	ARMATURE CLAMP	1	DUCTILE IRON	ASTM A339	1	2-336FD	2-336FD1			
17	ARMATURE CLAMP	1	DUCTILE IRON	ASTM A339	1	2-336FD	2-336FD2			
18	ARMATURE CLAMP NUT	1	CAST STEEL	ASTM A27 GR. 60-30	1	1-72BD	1-72BD1			
19	BLOCK	1	WOOD SEASONED MAPLE	—	—	1-3015B	1-3015B1			
20	BLOCK	1	WOOD SEASONED MAPLE	—	—	1-3015B	1-3015B2			
21	ARMATURE COIL	1 SET	COPPER	ASTM B48 TYPE DL	2	1-220AP	1-220AP1			1 SET CONSISTS OF 101 COILS
22	BRUSH RING	1	CAST IRON	ASTM A48 CL 30B	30	1-172JP	1-172JP2			
23	COVER	1	CAST IRON	ASTM A48 CL 30B	30	2-346ACM	2-346ACM2			
24	COVER	1	CAST IRON	ASTM A48 CL 30B	30	1-172LJ	1-172LJ1			
25	DISK	1	STEEL	ASTM A7 OR A36	2	1-353AE	1-353AE3			
26	DISK	1	STEEL	ASTM A7 OR A36	2	1-353AE	1-353AE1			
27	DISK	1	STEEL	ASTM A7 OR A36	2	1-353AE	1-353AE2			
28	DISK	1	STEEL	ASTM A7 OR A36	2	1-353AE	1-353AE4			
29	COVER	1	CAST IRON	ASTM A48 CL 30B	30	2-346ACM	2-346ACM2			
30	COVER	1	CAST IRON	ASTM A48 CL 30B	30	1-172LN	1-172LN1			
31	WICK	1	FELT	ASTM 16R1	—	2-488B	2-488B1			
32	WICK	1	FELT	ASTM 16R1	—	2-488B	2-488B2			
33	GASKET	1	VELLUMOID	—	—	4-376H	4-376H1			
34	GASKET	1	VELLUMOID	—	—	4-376H	4-376H2			
35	SHIM	2	PAPER	—	5	5-255KB	5-255KB1			
36	SHIM	2	PAPER	—	5	5-255KB	5-255KB2			
37	BRUSHES	—	—	—	—	1-6289G	—			
38	BRUSH STEM	8	BRASS	ASTM B16	3	1-474H	1-474H2			
39	PROTECTIVE PLUG	4	POLYETHYLENE	—	—	444AX	444AX7	PROTECTIVE CLOSURES CO.	1/2 SC	
40	SHIM	12	STEEL	—	—	2-255KC	2-255KC1			
41	SHIM	4	STEEL	—	—	2-255KC	2-255KC2			
42	SHIM	12	STEEL	—	—	2-255KC	2-255KC3			
43	SHIM	4	STEEL	—	—	2-255KC	2-255KC4			
44	PROTECTIVE PLUG	2	POLYETHYLENE	—	—	—	—	PROTECTIVE CLOSURES CO.	EP 22	
45	OTIS MEDALLION	2	15% NICKEL SILVER	—	—	104A	104A1			
46	CONDUCTOR	4	COPPER	ASTM D734	—	1-175AY	1-175AY1			
47	CONDUCTOR	4	COPPER	ASTM D734	—	1-175AY	1-175AY2			
48	BRAKE SWITCH	1	—	—	—	693JA	—			
49	TAPER PIN	2	STEEL	AISI C1018	18	80D	80D174			
50	TAPER PIN	2	STEEL	AISI C1018	18	80D	80D128			
51	BOLT	4	STEEL	—	—	2-83A	2-83A3			
52	BOLT	6	STEEL	—	—	2-58AD	2-58AD2			
53	POLE PIECE	8	STEEL	COML BLACK	41	1-355AL	1-355AL1			
54	FIELD COIL	1 SET	COPPER	ASTM B3 TYPE C	2	1-221BV	1-221BV1			1 SET CONSISTS OF 8 COILS
55	SPRING	8	STEEL	SAE 1075	SPRING-15	2-93DH	2-93DH1			
56	INTERPOLE-COMPLETE	1 SET	—	—	—	1-219AB	1-219AB1			1 SET CONSISTS OF 8 COILS
57	BOLT	24	STEEL	—	—	1-83A	1-83A2			
58	BOLT	24	STEEL	—	—	2-83A	2-83A5			
59	MARKING PLATE	1	BLACK FIBRE	—	—	102ES	102ES2			
60	TERMINAL BOARD	1	—	—	—	303G	303G10			
61	TAPER PIN	4	STEEL	AISI 4142	105	2-80D	2-80D1			
62	BOLT	8	STEEL	—	—	83A	83A50			
63	SPACER	4	BRASS	ASTM B16	3	9-462HA	9-462NA1			
64	GUIDE PLATE	2	SHEET STEEL	—	41A	5-386FN	5-386FN1			
65	CORE	2	STEEL	AISI C1018	2	3-400CD	3-400CD2			
66	CORE	2	STEEL	AISI C1018	2	5-400BY	5-400BY2			
67	COIL, MAGNET	2	COPPER	NEMA MW15	7	3-222JA	3-222JA1			
68	MAGNET CASE	1	CAST STEEL	ASTM A27	5	1-390CY	1-390CY1			
69	COVER	2	CAST STEEL	ASTM A27	5	1-346ACX	1-346ACX1			
70	SWITCH ARM	2	CAST BRONZE	ASTM B145	2	3-287BE	3-287BE2			
71	WASHER	4	BRASS	ASTM B16	3	2-128AG	2-128AG2			
72	ROD	1	STEEL	AISI C1018	10	2-96D	2-96D1			
73	GASKET	2	FELT RUBBER	—	—	1-376EE	1-376EE1			
74	LINK	2	STEEL	ASTM A27 OR A36	2	2-430BY	2-430BY2			
75	LEVER	2	CAST STEEL	ASTM A27 GRADE 70-36	1	2-288JN	2-288JN2			
76	PIN	2	STEEL	AISI C1018	10	81BN	81BN2			
77	PIN	2	STEEL	AISI C1018	10	1-82AN	1-82AN1			
78	PIN	2	STEEL	AISI C1018	10	10-82A	10-82A1			
79	PIN	2	STEEL	AISI C1018	10	7-82A	7-82A3			
80	SPRING	2		ASTM A125	SPRING-4	1-90TD	1-90TD3			
81	SPRING WASHER	2	CAST IRON	ASTM A27 GRADE 70-36	1	3015EC	B0431			
82	SPRING ROD	1	STEEL	AISI C1018	2	50TM	114851			
83	WASHER	2	STEEL	—	—	127VD	127VD28			
84	BRAKE ARM	2	DUCTILE IRON	ASTM A339	1	2286H	2286H2			
85	BRAKE SHOE	2	CAST IRON	ASTM A48 CL 30B	30	AA15W	AA15W2			
86	BOLT	2		AISI C1018	2	64TM	802269			
87	SPRING	2		ASTM A229	SPRING-3	90KC	90KC2			
88	PIN	2		AISI C1018	10	776B	776B7			
89	NUT, LOCK	2		—	—	67G	67G16			
90	SHOULDERED BOLT	2		AISI C1018	2	59BF	59BF3			
91	3/8-16 x 1 FIL CAP SCREW	2								
92	10-32 x 3/8 RD MACH SCR & NUT	4								
93	NO 10 INT LW	4								
94	5/8 x 1 3/4 FIN BOLT	4								
95	5/8 SPRING LOCKWASHER	4								
96	5/16 x 1 FIN BOLT	12								
97	5/16 INT LOCKWASHER	12								
98	1 SAE WASHER	4								
99	1/8 x 1 1/2 COTTER PIN	4	STEEL							
100	5/32 x 1 3/4 COTTER PIN	4	STEEL							
101	1 1/2 FIN NUT	2	STEEL							
102	1 1/2 FIN JAM NUT	2	STEEL							COM'L
103	1 1/2 S.A.E. WASHER	2	STEEL							
104	7/8-9 x 2 3/4 SOC SET SCR CUP PT.	2	STEEL							
105	7/8 FIN JAM NUT	2	STEEL							
106	5/8 x 2 FIN BOLT	2	STEEL							
107	5/8 FIN JAM NUT	2	STEEL							
108	1 1/4 FIN NUT	4	STEEL							
109	1/4 x 1 1/4 FIN BOLT	8	STEEL							
110	1/4 FIN NUT	8	STEEL							
111	1/4 EXT LOCKWASHER	8	STEEL							
112	1/2-20 NF JAM NUT	8	BRASS							
113	WASHER	8	STEEL	—	—	127F	127F17			—
114	10-32 x 5/8 RD MACH SCR	2	STEEL							
115	1/4 x 3/4 FIN BOLT	12	STEEL							
116	1/4 INT LOCKWASHER	14	STEEL							
117	5/8 x 5 1/2 FIN BOLT	6	STEEL							
118	1/4-20 x 1/2 RD MACH SCR	2	STEEL							
119	1 x 3 FIN BOLT	2	STEEL							
120	7/8 x 2 3/4 FIN BOLT	8	STEEL							COM'L
121	7/8 SPRING LOCKWASHER	8	STEEL							
122	5/8 x 8 FIN BOLT	6	STEEL							
123	1/8 PIPE PLUGS	8	IRON							

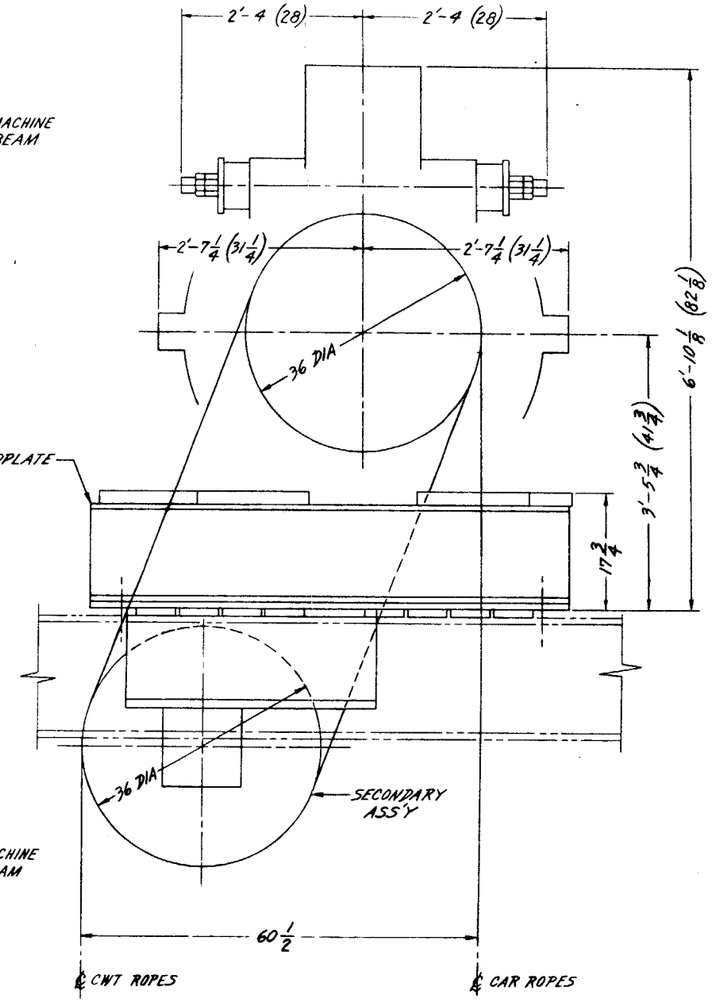
TOTAL WEIGHT OF MACHINE = 22,900 LBS.

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-300, SHEET 3.

Figure 8-33. Machine Assembly (Sheet 3 of 3)





VIEW FROM BRAKE END OF MACHINE

ARR Nº	HAND	BEDPLATE PART Nº	SECONDARY ASS'Y DWG Nº
1	AS SHOWN	30 301038-301	301038-305
2	OPPOSITE	31 301038-301	

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-306.

Figure 8-34. Machine Foundation Plan

NOTES:

1- JOHNS MANSVILLE SPLIT CLIPPER SEAL M/LS USE MOULD 4385R P.D. FOR 6.875 I.D. x 7.875 O.D. x .438

2- BEARING SETUP - PULL UP NUT UNTIL BEARINGS BIND SLIGHTLY WHILE ROTATING BEARINGS. BACK OFF NUT .001 TO .003. JAM OUTER NUT & LOCK BOTH NUTS WITH WASHER.

3- AT ASSY, PACK GREASE BY HAND BETWEEN ROLLERS, CAGE & RACES. COAT ALL FERROUS SURFACES INSIDE OF THE BEARING CHAMBER WITH GREASE. AFTER ASSY REMOVE PIPE PLUGS FROM COVERS & SHEAVE & PUMP GREASE INTO SHEAVE UNTIL IT APPEARS AT HOLES IN BOTH COVERS. REPLACE & TIGHTEN PLUGS IN COVERS & SHEAVE. CAUTION - DO NOT ATTEMPT TO PUMP GREASE INTO SHEAVE WITHOUT REMOVING PLUGS FROM COVERS.

FIELD ERECTION NOTES:

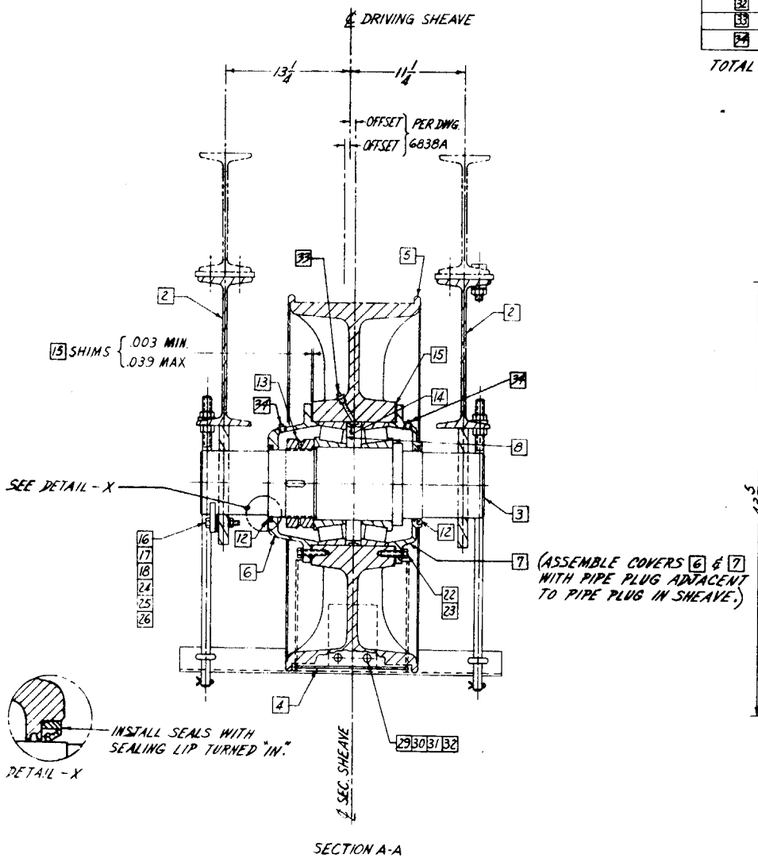
4- CENTER LINE OF SECONDARY SHEAVE MAY BE OFFSET TO EITHER SIDE OF CENTER LINE OF DRIVING SHEAVE.

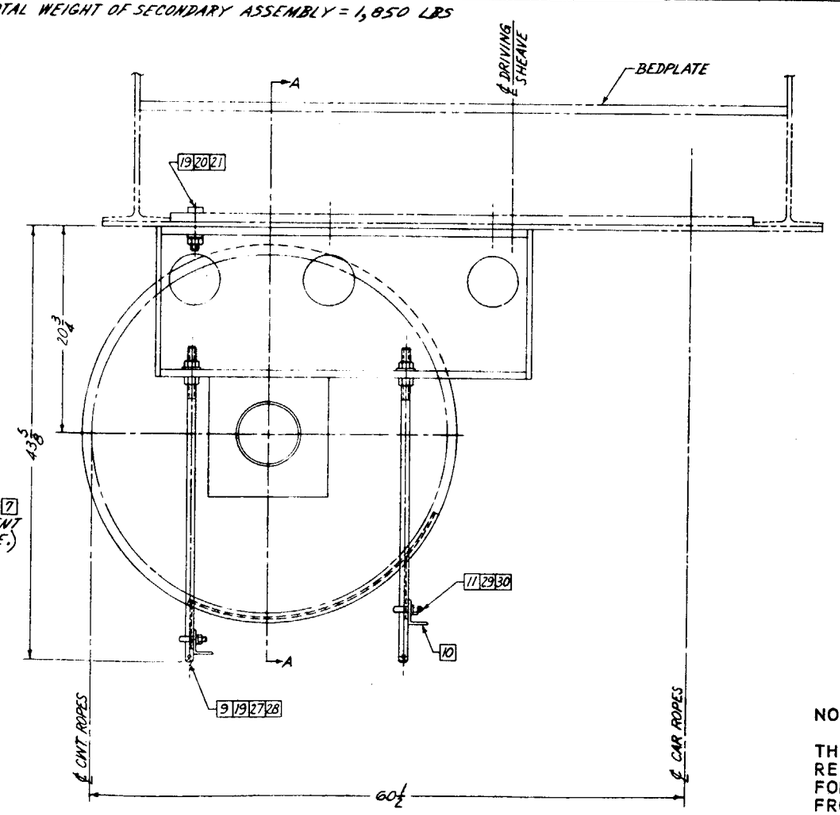
5- OFFSET SECONDARY SHEAVE PER LAYOUT TO SUIT ROPING CONDITIONS.

LIST OF MATERIAL —— QUANTITIES FOR ONE SECONDARY

PC NO	NAME	NO REQ'D	MATERIAL	MATL SPEC COM'L	MATL SPEC OTIS	CONTRACTOR DWG NO	CONTRACTOR SERVICE PART NO	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO	REMARKS
1	ASSEMBLY SECONDARY	—	——			301038-305	1			
2	BEAM, SECONDARY SUPPORT	2	STEEL	ASTM A7 OR A36	229	301038-302	4			
3	SHAFT	1			2	301038-303	2			
4	ROPE GUARD	1			241A	301038-304	4			
5	SHEAVE	1	CAST IRON	ASTM A48	40M	1-262R	1-262R6			
6	COVER	1		ASTM A48 CL30B	30	1-346ACR	1346ACR2			
7	COVER	1				1-346ACP	1346ACP2			
8	BEARING, TAPERED ROLLER	2	STEEL		——	209B	209B25	TIMKEN BEARING CO.		CONE - H239649 CUP - H239610
9	ROD	4		AISI C1018	10	3-86E	3-86E2			
10	ANGLE	2		ASTM A7 OR A36	9	1-272ASL	1-272ASL1			
11	U BOLT	4		AISI C1018	2	65C	65C11			
12	SEAL	2								SEE NOTE No 1
13	LOCKWASHER	1	STEEL					TIMKEN BEARING CO.	W136	
14	SPACER	1		ASTM A7 OR A36	2	1-462EH	1-462EH1			
15	SHIM	14	PLASTIC			4-255HB	4-255HB1			
16	PLATE	1	STEEL	ASTM A7 OR A36	2	386ML	386ML1			
17	SHIMS	4		——	——	255BB	255BB73			
18	SHIMS	5		——	——		255BB74			
19	WASHER, BEVEL	16	CAST IRON	——	3	131A	131A4			
20	7/8 x 3 ASKEW BOLT	12	STEEL					COM'L		
21	7/8 SPRING L.W.	12								
22	3/4 x 2 1/4 FIN BOLT	12								
23	3/4 SPRING L.W.	12								
24	5/8 x 3 FIN BOLT	2								
25	5/8 FIN NUT	2								
26	5/8 SPRING L.W.	2								
27	7/8 FIN NUT	8								
28	1/8 x 1 1/4 COTTER PIN	4								
29	1/2 FIN NUT	12								
30	1/2 SPRING L.W.	12								
31	1/2 x 1 1/2 FIN BOLT	4								
32	1/2 WASHER	4								
33	1/8 PIPE PLUG	1	IRON							
34	1/2 PIPE PLUG	2	IRON							

TOTAL WEIGHT OF SECONDARY ASSEMBLY = 1,850 LBS

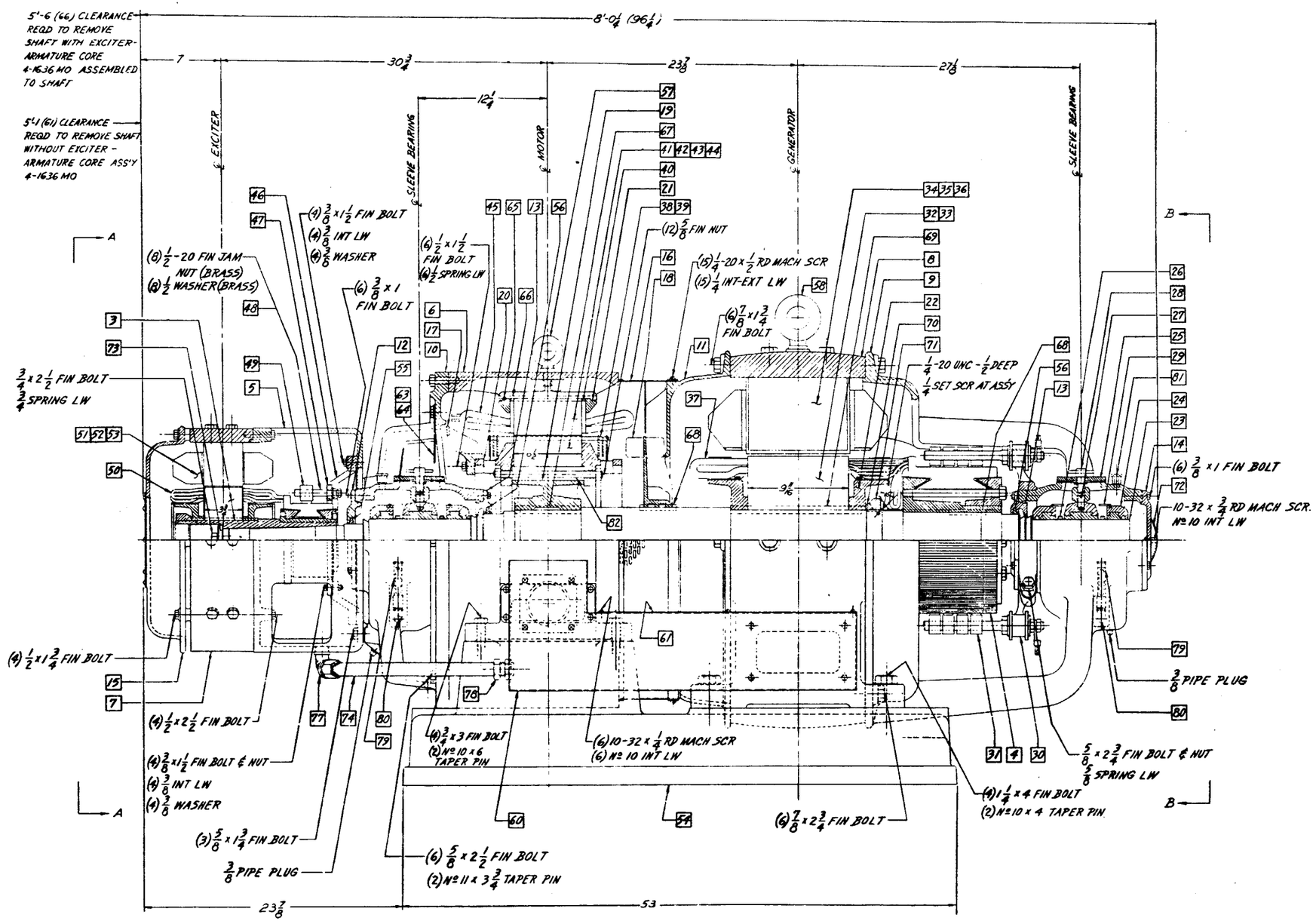

℄ DRIVING SHEAVE
13 1/2
11 1/4
OFFSET } PER DWG.
OFFSET } 6838A
15 SHIMS { .003 MIN. .039 MAX.
SEE DETAIL - X
(ASSEMBLE COVERS 6 & 7 WITH PIPE PLUG ADJACENT TO PIPE PLUG IN SHEAVE.)
INSTALL SEALS WITH SEALING LIP TURNED "IN."
DETAIL - X
℄ SEC. SHEAVE
SECTION A-A



NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-305.

Figure 8-35. Secondary Sheave

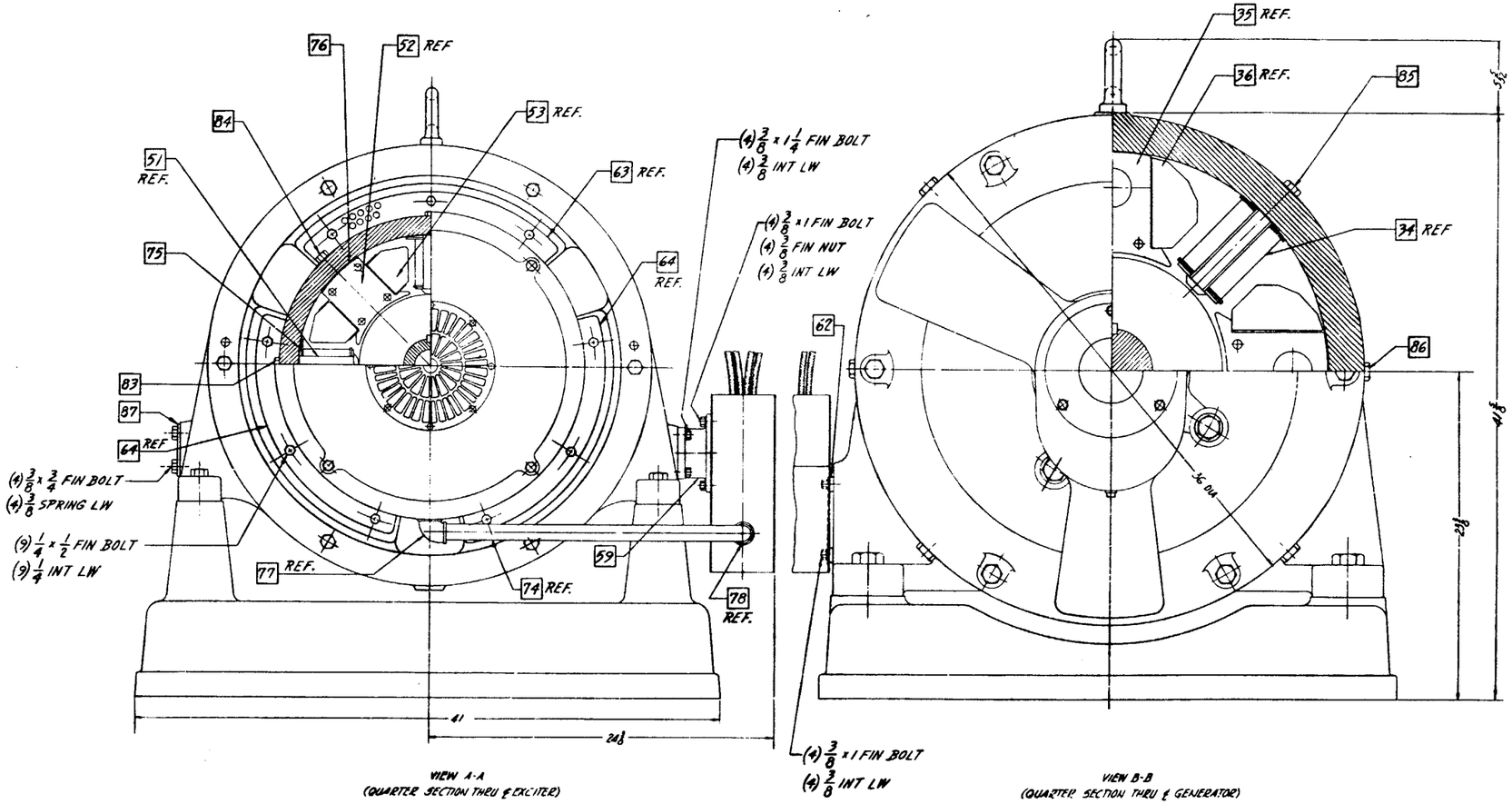

5'-6 (66) CLEARANCE REQD TO REMOVE SHAFT WITH EXCITER-ARMATURE CORE 4-1636 MO ASSEMBLED TO SHAFT
5'-1 (61) CLEARANCE REQD TO REMOVE SHAFT WITHOUT EXCITER - ARMATURE CORE ASS'Y 4-1636 MO
8'-0 1/4 (96 1/4)
7
30 3/4
12 1/4
23 7/8
27 1/8
℄ EXCITER
℄ SLEEVE BEARING
℄ MOTOR
℄ GENERATOR
℄ SLEEVE BEARING
A
B
(8) 1/2 - 20 FIN JAM NUT (BRASS)
(8) 1/2 WASHER (BRASS)
(4) 3/8 x 1 1/2 FIN BOLT
(4) 3/8 INT LW
(4) 3/8 WASHER
(6) 3/8 x 1 FIN BOLT
(6) 1/2 x 1 1/2 FIN BOLT
(6) 1/2 SPRING LW
(12) 5/8 FIN NUT
(15) 1/4 - 20 x 1/2 RD MACH SCR
(15) 1/4 INT-EXT LW
(6) 7/8 x 1 3/4 FIN BOLT
1/4 - 20 UNC - 1/2 DEEP 1/4 SET SCR AT ASSY
3/4 x 2 1/2 FIN BOLT
3/4 SPRING LW
(6) 3/8 x 1 FIN BOLT
10-32 x 3/4 RD MACH SCR. Nº 10 INT LW
(4) 1/2 x 1 3/4 FIN BOLT
(4) 1/2 x 2 1/2 FIN BOLT
(4) 3/8 x 1 1/2 FIN BOLT & NUT
(4) 3/8 INT LW
(4) 3/8 WASHER
3/8 PIPE PLUG
(4) 3/4 x 3 FIN BOLT
(2) Nº 10 x 6 TAPER PIN
(6) 10-32 x 1/4 RD MACH SCR
(6) Nº 10 INT LW
(6) 5/8 x 2 1/2 FIN BOLT
(2) Nº 11 x 3 3/4 TAPER PIN
(3) 5/8 x 1 3/4 FIN BOLT
(6) 7/8 x 2 3/4 FIN BOLT
5/8 x 2 3/4 FIN BOLT & NUT
5/8 SPRING LW
(4) 1 1/4 x 4 FIN BOLT
(2) Nº 10 x 4 TAPER PIN
23 7/8
53

FOR END VIEWS A-A & B-B SEE SHEET 3

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-307, SHEET 1.

Figure 8-36. Motor-Generator Set (Sheet 1 of 3)



VIEW A-A
(QUARTER SECTION THRU EXCITER)

VIEW B-B
(QUARTER SECTION THRU GENERATOR)

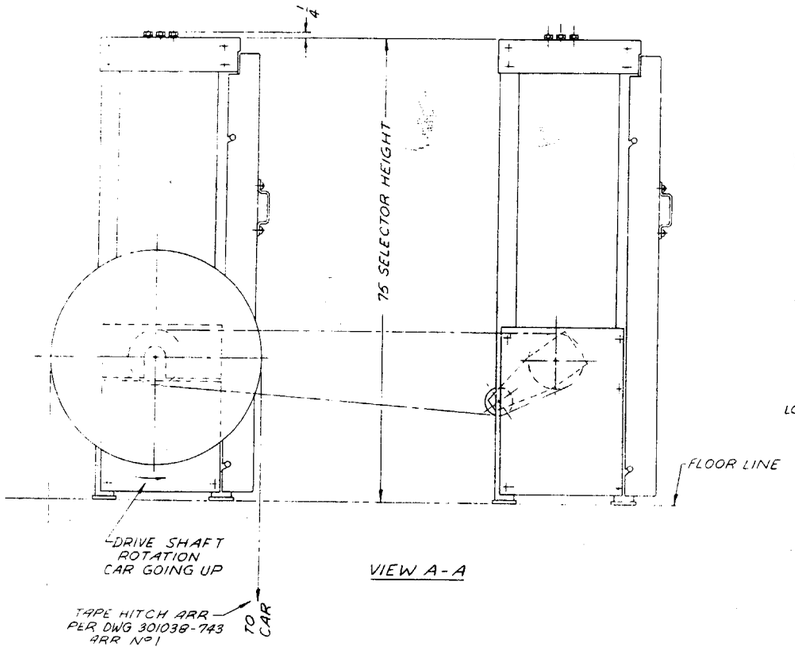
NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-307, SHEET 2.

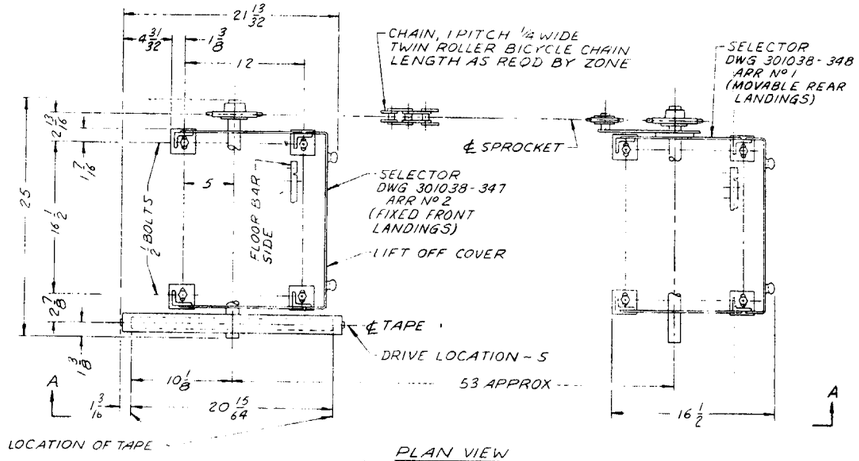
Figure 8-36. Motor-Generator Set (Sheet 2 of 3)

LIST OF MATERIAL — QUANTITIES FOR ONE 5B MG SET

PC №	NAME	NO REQ'D /1	NO REQ'D /2	MATERIAL	MAT'L SPEC COM'L	MAT'L SPEC OTIS	CONTRACTOR DWG №	CONTRACTOR SERVICE PART №	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR APPL №	UNIT WT LB	REMARKS
1	ASS'Y 5B MG. SET R.H.	1	—	—	—	—	301038-307	/1				
2	ASS'Y 5B MG. SET L.H.	—	1					/2				
3	ARMATURE & COMMUTATOR CORE, COMPLETE EXCITER	1	1				4-1636M0	—				
4	COMMUTATOR, GENERATOR	1	1	CAST STEEL COPPER	ASTM A27	1	2-6309C	2-6309C3				
5	FRAME ADAPTER, EXCITER	1	1	CAST IRON	ASTM A48-60T CL 30B	30	1-1615M0	1-1615M01				
6	FRAME, STATOR	1	1				1-1635M0	1-1639M01				
7	FRAME, FIELD, EXCITER	1	1	STEEL	AISI C1020	—	3-366P	3-366P1				
8	FRAME, FIELD, GENERATOR	1	1	CAST STEEL	ASTM A27	5	1624M0	166696				
9	FRAME, BEARING, GEN.	1	1	CAST IRON	ASTM A48-60T CL 20A	1	1614M0	166648				
10	FRAME, BEARING MOTOR	1	1		ASTM A48-60T CL 30B	30	1-358BN	1-358BN1				
11	COVER, GEN. SEGMENTS	3	3	ALUMINUM	ASTM B26-62T	47	1-346ACW	1-346ACW1				
12	COVER, BEARING	1	1	CAST IRON	ASTM A48-60T CL 20A	1	1618M0	166656				
13		2	2					166658				
14		1	1			20	3-346ADP	3-346AD1				
15	COVER, EXCITER	1	1	ALUMINUM	ASTM B26-62T	47	1-279F	1-279F2				
16	COVER, GUARD	3	3	SHEET STEEL	ASTM A415	41	2-346ZD	2-346ZD1				
17	FAN	1	1	ALUMINUM	ASTM B26-62T	47	3-301D	3-301D1				
18	VANE, RING	1	1				2-172CB	2-172CB3				
19	SPIDER, ROTOR	1	1	CAST IRON	ASTM A48-60T CL30B	30	1612M0	166648				
20	CLAMP RING, ROTOR	2	2		ASTM A48-60T CL20A	20	1-1617M0	1-1617M01				
21	CLAMP RING, STATOR	2	2		ASTM A48-60T CL 30B	30	3-172JX	3-172JX1				
22	CLAMP PLATE, ARM.	2	2				1-A1621M0	1-A1621M01				
23	SHAFT	1	1	STEEL FORGING	AISI C1045	60	2-A1628M0	2-A1628M01				
24	SLEEVE BEARING	2	2	CAST IRON	ASTM A48-60T CL 20A	20	1623M0	166687				
25	COVER, OIL RESEVOIR	2	2	STEEL	AISI C1018	2	2-1618M0	2-1618M02				
26	OIL RING	4	4	BRONZE	ASTM B145-4A		172CV	172CV1				
27	SLEEVE SCREW	2	2	STEEL	AISI C1018	10	1618M0	813055				
28	STUD, OIL LID	2	2				1618M0	166661				
29	RING-SPRING, RETAINING	4	4	SPRING STEEL	ASTM A229	3	94F	94F10				
30	BRUSH YOKE COMPLETE, GEN.	1	1	C.I. & BRASS	ASTM A48-60T CL 30B / ASTM B16	30 / 3	1-1613M0	—				
31	BRUSH-HOLDER COMPLETE, GEN.	16	16	SILICON BRONZE	ASTM B176-52-25-144A	—	6134A	6134A1				
32	LAMINATION, ARMATURE, GEN.	370	370	STEEL	AISI TY M27	108	2-1638M0	2-1638M01	—	—	—	STACK: 9 11/16 INCH LG
33	END LAMINATION, ARM. GEN.	8	8		ASTM A415	41		2-1638M02				
34	INTERPOLE COIL COMPLETE, GEN.	1 SET	1 SET	STEEL & COPPER	ASTM A415 / ASTM B152-58	41 / 19	1-1669M0	1-1669M02				
35	MAIN POLE PIECE, GEN.	4	4	STEEL	ASTM A415 / AISI C1020	41 / 2	1620M0	166669				
36	FIELD COIL, GEN.	1 SET	1 SET	COPPER	—	SEC WIRE	3-1631M0	3-1631M03				
37	ARMATURE COIL, GEN.	60	60		—	DCC WIRE #2	2-1619M0	2-1619M01	—	—	—	
38	END RING, ROTOR	6	6		ASTM B152-58	18	1629M0	166752				
39	ROTOR BAR	143	143		ASTM B152-58 TYPE ETP	16	SK12652	143812				
40	RING, VENTILATING	2	2	STEEL	ASTM A36-58T	115	3-172EE	3-172EE1				
41	LAMINATION, STATOR	270	270		AISI TY M27	108	1625M0	166706	—	—	—	STACK=6½ INCH LG
42	END LAMINATION, STATOR	2	2		ASTM A415	41		166707				
43	LAMINATION, ROTOR	270	270		AISI TY M27	108		166709				
44	END LAMINATION, ROTOR	2	2		ASTM A415	41		166710				
45	STATOR COIL	90	90	COPPER	—	DCC WIRE	1610M0	—				
46	BRUSH RING EXCITER	1	1	CAST IRON	ASTM A48-60T CL 30B	30	1-172FF	1-172FF1				
47				PHENOLIC	NEMA GRADE-CE	11	3-172EK	3-172EK1				
48	BRUSH STEM, EXC.	4	4	BRASS	ASTM B16-60	3	2-79AX	2-79AX1				
49	BRUSH-HOLDER COMPLETE, EXC.	4	4	ZINC DIE CAST	B240-52T ALLOY AC41A	7	1-6134C	—				
50	ARMATURE COIL COMPL, EXC.	41 DWG A	41 DWG A	COPPER	—	DCC WIRE	3-1335M0	—				
51	INTERPOLE COIL COMPL, EXC.	1 SET	1 SET	COPPER STEEL	ASTM B 52-58 / AISI-C1020	19 / 2	3-B219B	3-B219B1				
52	MAIN POLE PIECE, EXC.	4	4	STEEL	ASTM A415	41	1-A355N	1-A355N1				
53	SET, FIELD COIL, EXC.	1 SET	1 SET	COPPER	—	SCE & DCC WIRE	1-221BY	1-221BY1				
54	BEDPLATE	1	1	CAST IRON	ASTM A48-60T CL 20A	20	1627M0	166746				
55	RING, SEAL	1	1	VELLUMOID	MIL-P-20085	—	M.L.-5536-III-1	174342				
56		2	2			—		174343				
57	EYE BOLT	1	1	STEEL FORGING	AISI C1020	2	3186ED	81839				
58		1	1			2	1624M0	800587				
59	ADAPTER TERMINAL BOX	1	1	CAST IRON	ASTM A48-60T CL 20A	20	1440M0	166825				
60	TERMINAL BOX R.H.	1	—	STEEL	ASTM A485	41A	3-308A	3-308A1				
61	TERMINAL BOX L.H.	—	1			41A		3-308A2				
62	COVER TERM. BOX	1	1			41	2-3461	2-3461				
63	BAR, FLAT GUARD	2	2		AISI C1020	2	4-A2996	4-A2961				
64		1	1		ASTM A415	41	3-346ZD	3-346ZW				
65		2	2					3-346ZX2				
66	KEY 1/4 x 1/4 x LG SQ ENDS	12	12		AISI C1018	18		192E				
67	KEY 1/2 x 1/2 x 7 1/8 SQ ENDS	1	1					192E1				
68	KEY 3/4 x 3/4 x 6 1/4 RD ENDS	1	1					SK10800				
69	KEY 1/2 x 1/2 x 3 1/2 RD ENDS	2	2					802168				
70	KEY 3/4 x 3/4 x 12 1/2 RD ENDS	1	1					A1628M0				
71	WASHER	1	1					192G				
72	NUT	1	1					A1628M0				
73	MEDALLION	1	1	15% NICKEL-SILVER	—	—		131CA				
74	PIPE CONDUIT	1	1	STEEL	ASA C1018	2		192A				
75	SHIM	4	4	BRASS	ASTM B36-46	13		104A				
76		4	4		THN MILL BLACK	—		104A1				
77	1 x 90° ELBOW	1	1	STEEL				1-127IB				
78	CONDUIT CONNECTOR	1	1					3-127IB				
79	OIL GAUGE	2	2	BRASS	—	—		2-342IA				
80	3/8 x 90° STREET ELBOW	2	2					2-342IA1				
81	3/8 AIR VENT	2	2	MONEL METAL				1-255GA				
82	5/8 x 10 1/8 THD'D ROD (ROTOR)	6	6	STEEL				1-255GA1				
83	1/2-12 UNDERSIZE FIN BODY BOLT	8	8		ASTM A307 SAE GR2	—		3-255MB				
84	5/8-11 UNDERSIZE FIN BODY BOLT	8	8			—		3-255MB1				
85	3/4-10 UNDERSIZE FIN BODY BOLT	8	8			—			APPLETON	TWE-1001 / 367100		APPLETON ELECTRIC CO. CHICAGO 13, ILL.
86	1-8 5/8 UNDERSIZE FIN BODY BOLT	8	8			—			GITS BROS.	4224 STYLE W-6		GITS BROS MFG. CO. CHICAGO 23, ILL.
87	COVER TERM. BOX OPENING	1	1		ASTM A415	41	1639M0	166845				
							301038-307	80				
							—	—				
					ASTM A307 SAE GR2	—						

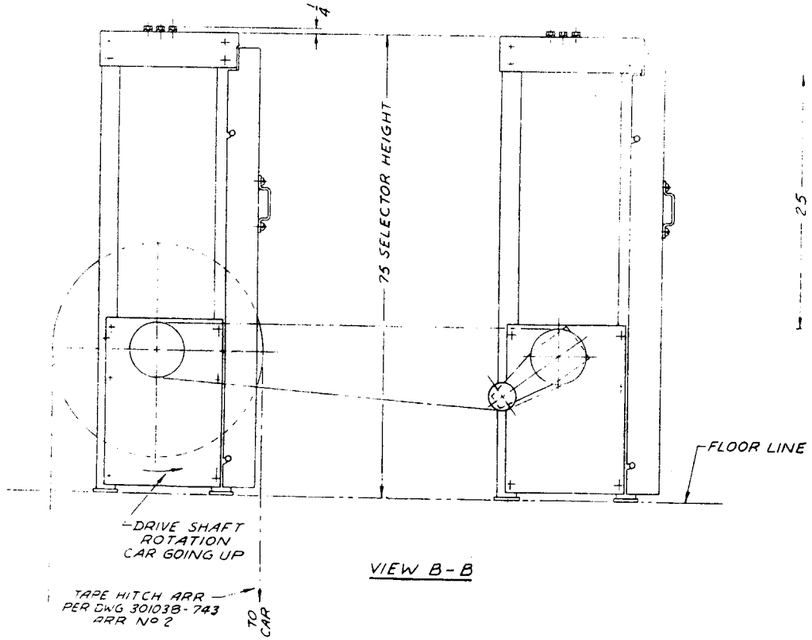


VIEW A-A

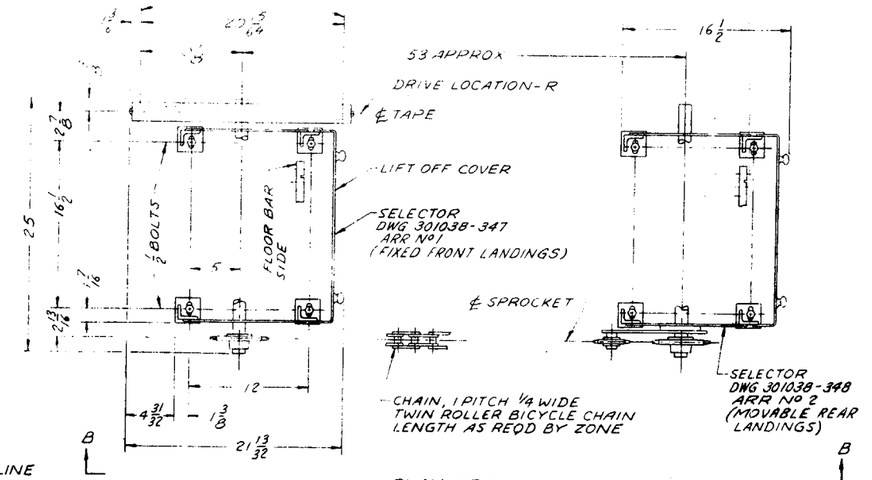


PLAN VIEW
(TOP COVERS REMOVED)

SELECTOR ARR APPLYING ON	
ELEV Nº	TOWER LOC
5	B
10	D
12	E
14	E
1	A
3	B



VIEW B-B



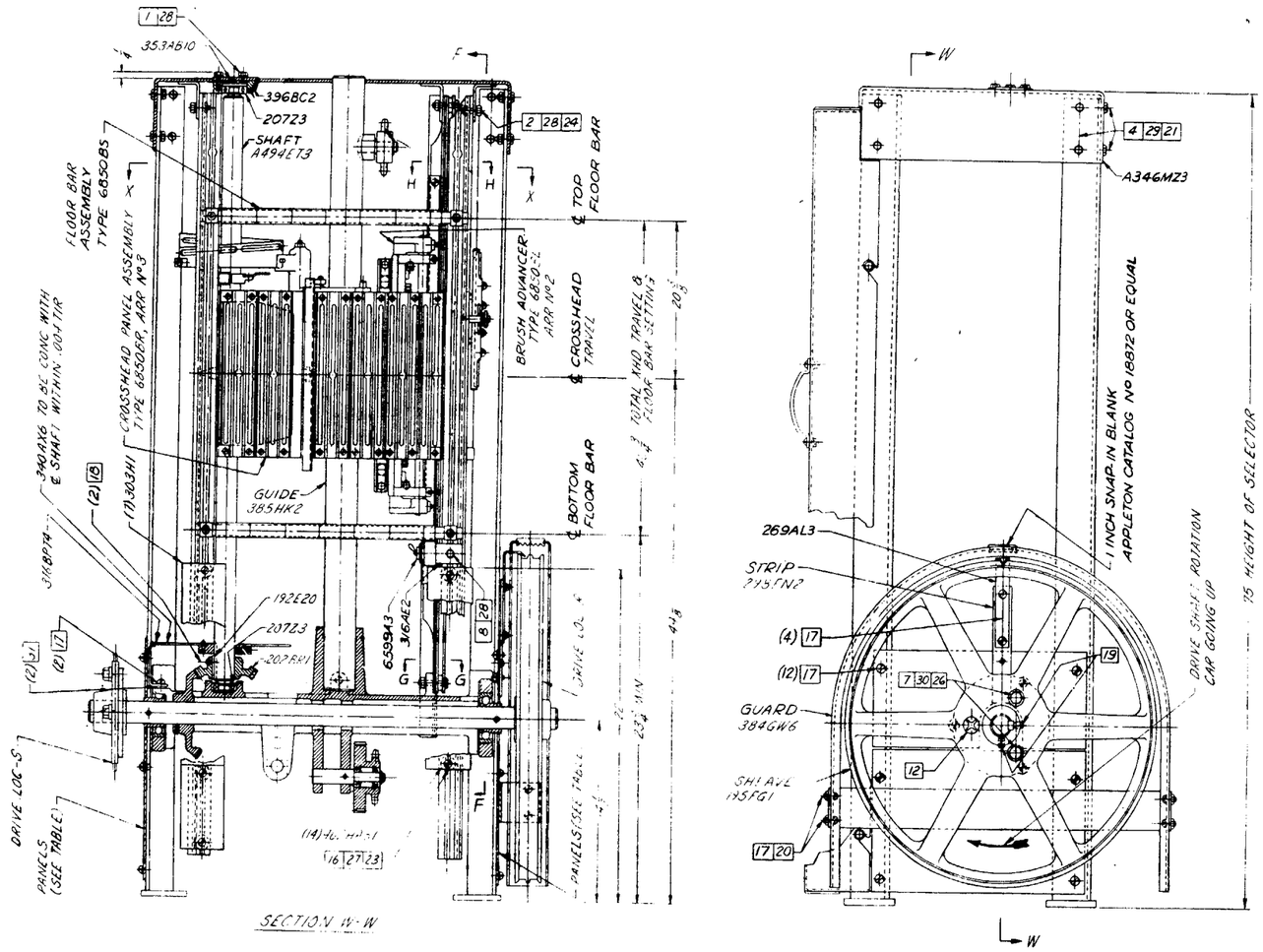
PLAN VIEW
(TOP COVERS REMOVED)

SELECTOR ARR APPLYING ON	
ELEV Nº	TOWER LOC
4	B
9	D
11	E
13	E
15	F
6	B

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-346.

Figure 8-37. Selector Arrangement



ARR No	LOCATION OF TAPE SHEAVE	LOCATION OF CHAIN SPROCKET	PANELS SHEAVE SIDE CENTER	PANELS SHEAVE SIDE BOTTOM	PANELS SPROCKET SIDE BOTTOM	REQUIRED FOR CONTRACT Nos
1	R	S	438DK2	A438BZ7	6-A438BY2	301038, 40, 42, 44 & 46, 302388
2	S	R	438DK2	A438B2B	6-A438BY2	301039, 41, 43 & 45, 302386 & 7

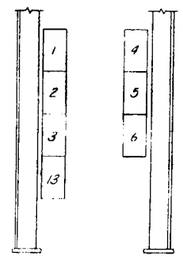
1	1/4 x 3/4 FIN BOLT
2	1/4 x 1 FIN BOLT
3	1/4 x 1 1/2 FIN BOLT
4	5/16 x 3/4 FIN BOLT
5	5/16 x 1 FIN BOLT
6	3/8 x 3/4 FIN BOLT
7	3/8 x 1 FIN BOLT
8	1/4 x 3/4 MACH BOLT
9	1/4 x 1 MACH BOLT
10	3/8 x 2 3/4 MACH BOLT
11	5/16-18 x 1 FLAT MACH SCR
12	3/8-16 x 1 FLAT MACH SCR 3/8 CSK LW ASSEMBLY
13	10-32 x 1/2 RD MACH SCR
14	10-32 x 5/8 RD MACH SCR NO10 EXT LW ASSEMBLY
16	10-32 x 1 1/2 RD MACH SCR
17	1/4-20 x 3/8 RD MACH SCR 1/4 EXT LW ASSEMBLY
18	1/4 x 3/8 HEX SOCK SET SCR, CUP PT
19	3/8 x 1/2 HEX SOCK SET SCR, CUP PT
20	1/4 FIN NUT
21	5/16 FIN NUT
22	3/8 FIN NUT
23	10-32 SQ MS NUT
24	1/4-20 SQ MS NUT
25	NO10 WASH
26	3/8 WASH
27	NO10 INT LW
28	1/4 INT LW
29	5/16 INT LW
30	3/8 INT LW
31	1/4 WASH
32	10-32 X 3/8 RD MACH SCR NO10 LW ASSEMBLY

NOTE:

1- ALL MACHINE SCREWS TO BE PHILLIPS RECESSED HEAD TYPE

2- ALL HARDWARE CADMIUM PLATED PER 26DJ4

3- SEE SHEET No 2 FOR SECTIONS F-F, G-G, H-H & X-X

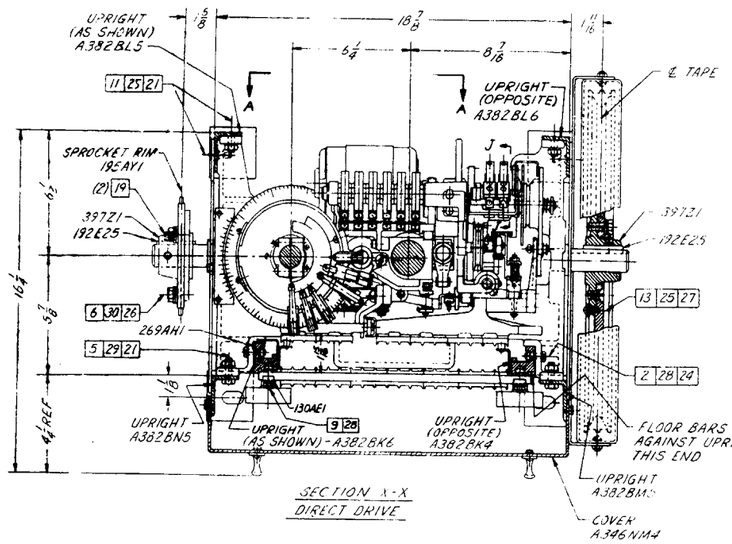


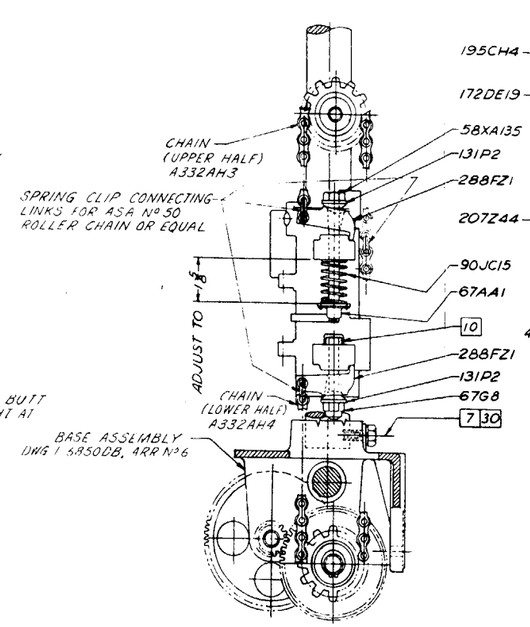
ARRANGEMENT OF TERMINAL BLOCKS

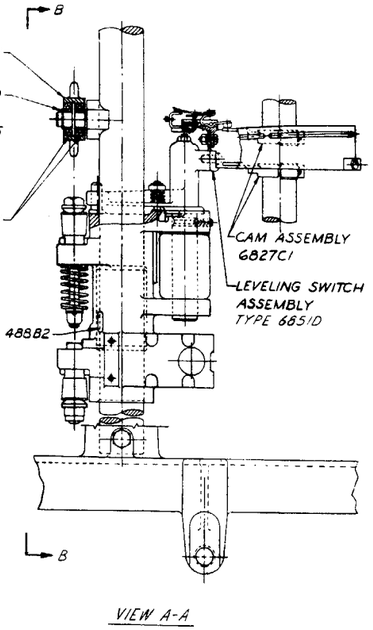
NOTE:

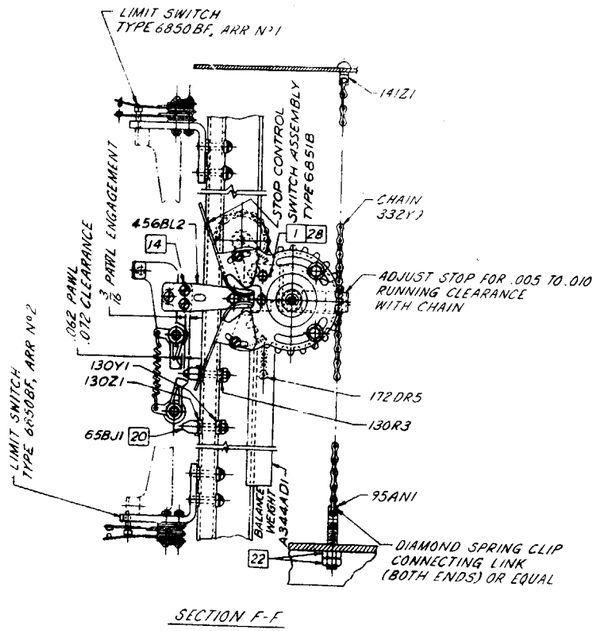
THE CONFIGURATION SHOWN ON THIS DRAWINC REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-347, SHEET 1.

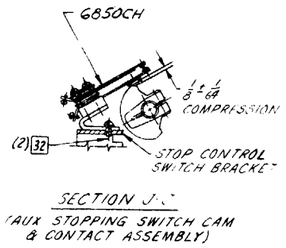
Figure 8-38. Selector Assembly, Fixed Levels (Sheet 1 of 3)

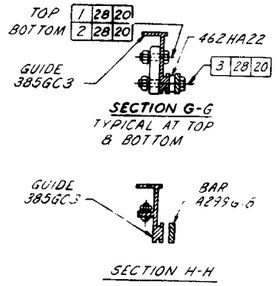












NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-347, SHEET 2.

Figure 8-38. Selector Assembly, Fixed Levels (Sheet 2 of 3)

NOTES:

NO 1 ~ ARRANGEMENT OF SWITCHES AS SPECIFIED

NO 2 ~ ARRANGEMENT OF CONTACTS AS SPECIFIED

NO 3 ~ INCLUDING QUANTITY FOR FUTURE FLOOR STOPS (LISTED BELOW)

APPLYING ON		QUANTITY ~ FUTURE STOPS					
SELECTOR PER DWG NO	CONTRACT NO	6827C1	65BJ1	130R3	130Y1	130Z1	130AE1
301038-347 ARR NO 2	301039	19	19	19	19	19	38
	301041	17	17	17	17	17	34
	301043	12	12	12	12	12	24
	301045	12	12	12	12	12	24
	302386	19	19	19	19	19	38
	302387	19	19	19	19	19	38
301038-347 ARR NO 1	301038	19	19	19	19	19	38
	301040	17	17	17	17	17	34
	301042	12	12	12	12	12	24
	301044	12	12	12	12	12	24
	301046	18	18	18	18	18	36
	302388	19	19	19	19	19	38

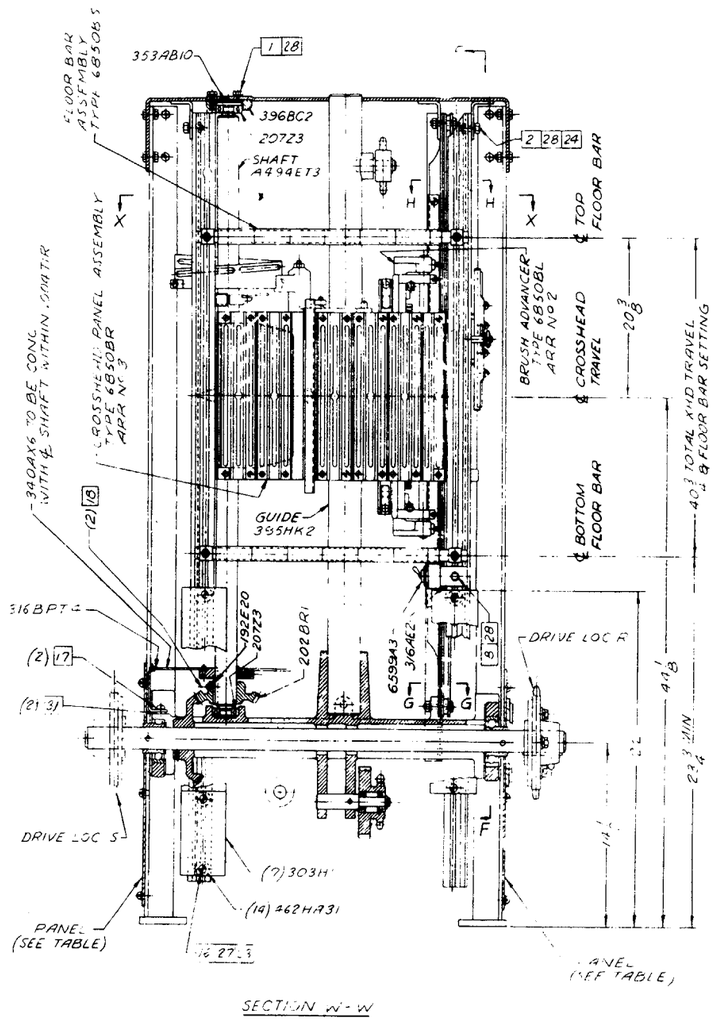
LIST OF MATERIAL —— QUANTITIES FOR ONE SELECTOR

CONTRACTOR SERVICE PART NO	NAME	NO. REQ'D	MATERIAL	MATL SPEC COML.	MATL SPEC OTIS	MANUFACTURER NAME	MANUFACTURER SOURCE FROM OR PART NO	UNIT WT LB	REMARKS
6599A3	ASSEM. SPST SWITCH	1	—	—	—				
6827C1	ASSEM. CAM	37	—	—	—				SEE NOTE NO 3
6850BF, ARR. NO 1	ARR. LIMIT SW (TOP)	1	—	—	—				
6850BF, ARR. NO 2	ARR. LIMIT SW (BOTT)	1	—	—	—				
6850BR, ARR. NO 3	ASSEM. XHD PANEL	1	—	—	—				SEE NOTE NO 1
6850BS	ARR. FLOORS	1	—	—	—				SEE NOTE NO 2
6850CH	ASSEM. AUX. STOP SW.	1	—	—	—				
6850BL, ARR. NO 2	ASSEM. XHD & BRUSH ADK	1	—	—	—				
1-6850DB, ARR. NO 6	ASSEM. BASE	1	—	—	—				
6851B	ASSEM. STOP CONT. SW.	1	—	—	—				
A6851D	ASSEM. LEV. SW.	1	—	—	—				SEE NOTE NO 1
67AA1	LOCK NUT (ASSEM.)	1	STEEL	—	—				
303H1	TERM. BOARD (ASSEM)	7	PHENOLIC	—	—				
316BPT4	BRACKET (ASSEM.)	1	STEEL	—	—				
340AX6	COLLAR (ASSEM.)	1		—	—				
385GC3	GUIDE (ASSEM.)	1	ALUMINUM	—	—				
456BL2	ROLLER (ASSEM.)	1	CARBON	—	—				
306JM2	BASE	1	CAST IRON	ASTM-A48 CL 25B-30A ASTM-303 PICKLED & OILED	NO 20 NO 41A				SEE DWG 1-6850DB SEE DWG 1-6850DB
339CB1	CLIP	4	STEEL	AISIC1040	COML				SEE DWG 1-6850DB
1-494JB6	SHAFT	1		SAE GRADE 2	COML				
58XA135	BOLT (SPECIAL)	1		AISIC1018	NO 1B				SEE NOTE NO 3
65BJ1	BOLT (PAWL)	37		—	COML	ESNA	29NU066		
67G8	STOP NUT	1		ASTM-A229	NO 3				
90JC15	SPRING	1		ASTM-A108	NO 10				
95AN1	STUD	1		AISIC1050	COML				SEE NOTE NO 1
130R3	LOCKWASHER	37		QQ-S-00692 CLASS-C	NO 16				SEE NOTE NO 1
130Y1	LOCKWASHER	37		ASTM-303 PICKLED & OILED	NO 41A				SEE NOTE NO 1
130Z1	LOCKWASHER	37		ASTM-A108	NO 10				SEE NOTE NO 1
130AE1	LOCKWASHER	74		—	COML	WALDES	5100-19		
131P2	WASHER	2				TRUARC	5133-9		
141Z1	RIVET	1		AISIC1018	NO 1B				
172DE19	RETAINING RING	1		ASTM-A48 CLASS-20A	NO 20				
172DA5	RETAINING RING	1		ASTM-A108	NO 10				
192E20	KEY	1		ASTM-303 PICKLED & OILED	NO 41A				
192E25	KEY	2		ASTM-B16	NO 47				
195AY1	SPROCKET RIM	1	CAST IRON	ASTM-303 PICKLED & OILED	NO 41A				
195CH4	SPROCKET	1	STEEL	ASTM-A108	NO 10				
195FG1	SPROCKET	1	CAST IRON	ASTM-303 PICKLED & OILED	NO 41A				
202BR1	BEVEL GEAR	1		ASTM-A108	NO 10				
207Z3	BALL BEARING	2	STEEL	ASTM-303 PICKLED & OILED	NO 41A				
207Z44	BALL BEARING	2		—	COML	MRC	202-SFF 102-KSFF		
269AH1	INDICATOR	1	VINYL	—	—				
269AL3	INDICATOR	1	STEEL	ASTM-303 PICKLED & OILED	NO 41A				
288FZ1	LEVER	2	ALUMINUM	ALLOY 356-T6	NO 47				
298FN2	STRIP	1	STEEL	ASTM-303 PICKLED & OILED	NO 41A				
A299G18	BAR	1		ASTM-A108	NO 10				
316AE2	BRACKET	1		ASTM-303 PICKLED & OILED	NO 41A				
332Y9	CHAIN	1		—	COML	DIAMOND	NO 65		
A332AH3	CHAIN (UPPER HALF)	1					NO 50		
A332AH4	CHAIN (LOWER HALF)	1							
A344AD1	BALANCE WEIGHT	1	BABBITT	—	NO 1				
A346MZ3	COVER (TOP)	1	STEEL	ASTM-415 PICKLED & OILED	NO 41A				
A346NM4	COVER (FLOOR BARS)	1		ASTM-303 PICKLED & OILED					
353AB10	DISK	1	ALUMINUM	ALLOY 6063-T5	NO 41				
A382BK4	UPRIGHT (OPPOSITE)	1	STEEL	ASTM-A7 OR ASTM-A36 (BASIC)	NO 9				
A382BK6	UPRIGHT (AS SHOWN)	1							
A382BL5	UPRIGHT (AS SHOWN)	1							
A382BL6	UPRIGHT (OPPOSITE)	1							
A382BM5	UPRIGHT	1							
A382BN5	UPRIGHT	1							
384GW6	GUARD	1		ASTM-303 PICKLED & OILED	NO 41A				
385HK2	GUIDE	1		AISIC1025	COML				
396BC2	HOUSING	1		ASTM-A108	NO 10				
397Z1	SPROCKET HUB	2	CAST IRON	ASTM-A48 CL 25B-30A	NO 20				
6-A438BY2	PANEL (BOTTOM)	1	STEEL	ASTM-303 PICKLED & OILED	NO 41A				MFGD FOR ARR NO 1 (RIGHT HAND SEL.)
A438BZ7	PANEL (BOTTOM R.H.)	1							MFGD FOR ARR NO 2 (LEFT HAND SEL.)
A438BZ8	PANEL (BOTTOM L.H.)	1							
438DK2	PANEL (CENTER)	1							
462HA22	STEEL SPACER	2		ASTM-A108	NO 10				
462HA31	STEEL SPACER	14							
480B2	WICK	1	FELT	ASTM-D944	NO 2				
A494ET3	SHAFT	1	STEEL	AISIC1040	COML				
———	SPRING CLIP	2		—		DIAMOND	A29		
———	CONNECTING LINK	3		—			A29-SF		
———	SNAP-IN BLANK	1		—			A29-BP		
———	CHAIN	1		—		APPLETON	1887E		
301038-743, ARR NO 1	ARR. TAPE HITCH	1	—	—	—	DIAMOND	NO 61		LENGTH AS REQ'D REQ WITH PART NO 2 (LEFT HAND SEL.)
301038-743, ARR NO 2	ARR. TAPE HITCH	1							REQ WITH PART NO 1 (RIGHT HAND SEL.)

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-347, SHEET 3.

Figure 8-38. Selector Assembly, Fixed Levels (Sheet 3 of 3)



1	1/4 x 3/4 FIN BOLT
2	1/4 x 1 FIN BOLT
3	1/4 x 1 1/2 FIN BOLT
4	5/16 x 3/4 FIN BOLT
5	5/16 x 1 FIN BOLT
6	3/8 x 3/4 FIN BOLT
7	3/8 x 1 FIN BOLT
8	1/4 x 3/4 MACH BOLT
9	1/4 x 1 MACH BOLT
10	3/8 x 2 3/4 MACH BOLT
11	5/16-18 x 1 FLAT MACH SCR
14	10-32 x 5/8 RD MACH SCR NO10 EXT LW ASSEMBLY
16	10-32 x 1 1/2 RD MACH SCR
17	1/4-20 x 3/8 RD MACH SCR 1/4 EXT LW ASSEMBLY
18	1/4 x 3/8 HEX SOCK SET SCR, CUP PT
19	3/8 x 1/2 HEX SOCK SET SCR CUP PT
20	1/4 FIN NUT
21	5/16 FIN NUT
22	3/8 FIN NUT
23	10-32 SQ MS NUT
24	1/4-20 SQ MS NUT
26	3/8 WASH
27	NO10 INT LW
28	1/4 INT LW
29	5/16 INT LW
30	3/8 INT LW
31	1/4 WASH
32	10-32 x 3/8 RD MACH SCR NO10 LW

NOTES:

1. ALL MACHINE SCREWS TO BE PHILLIPS RECESSED HEAD TYPE
2. ALL HARDWARE CADMIUM PLATED PER 260J4
3. SEE SHEET N°2 FOR SECTIONS FF, GG, HH & XX

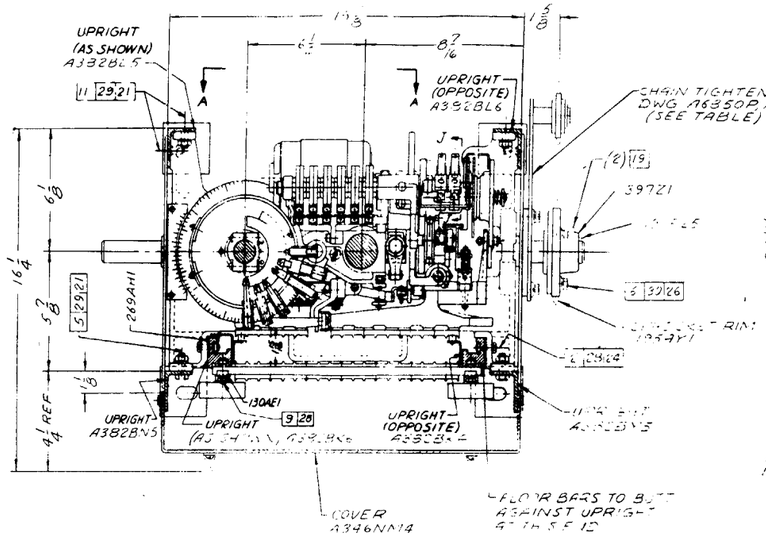
ARR N°	LOCATION OF SPROCKET	PANELS DRIVE SIDE	PANELS OPPOSITE DRIVE SIDE	REQUIRED FOR CONTRACT N°s
		BOTTOM		
1	R	A685OP, ARR N°2	G-A438BY2	301039, 41, 43 & 45, 302386 & 7
2	S	A685OP, ARR N°4		301038, 40, 42, 44 & 46, 302388

ARR OF TERMINAL BLOCKS

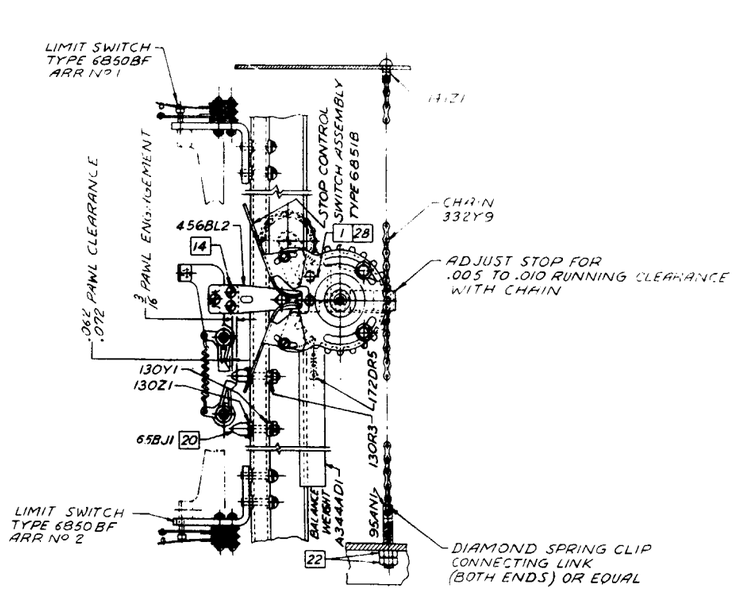
NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-348, SHEET 1.

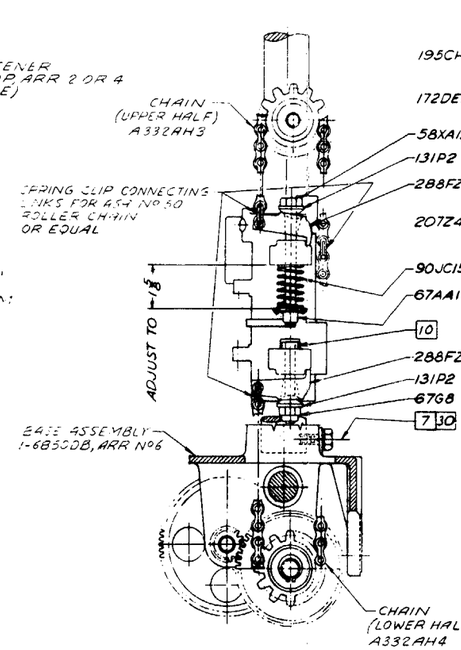
Figure 8-39. Selector Assembly, Adjustable Platforms (Sheet 1 of 3)



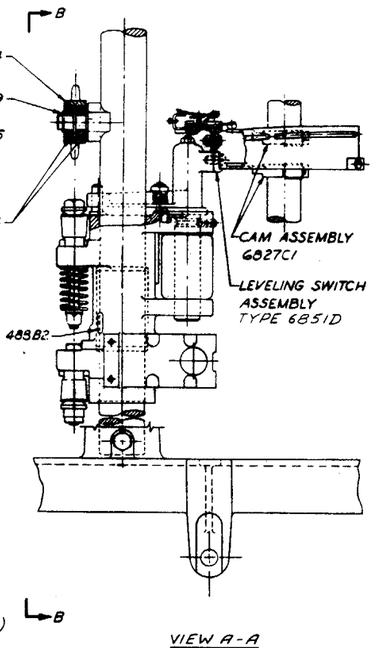
SECTION X-X
SEPARATE DRIVE


LIMIT SWITCH TYPE 6850BF ARR NO 1
STOP CONTROL SWITCH ASSEMBLY TYPE 6851B
.062 PANL CLEARANCE .072
456BL2
CHAIN 332Y9
ADJUST STOP FOR .005 TO .010 RUNNING CLEARANCE WITH CHAIN
130Y1
130Z1
65BJ1
LIMIT SWITCH TYPE 6850BF ARR NO 2
DIAMOND SPRING CLIP CONNECTING LINK (BOTH ENDS) OR EQUAL

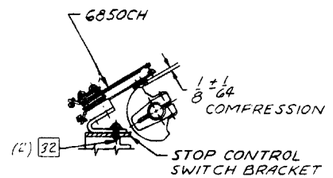
SECTION F-F


CHAIN (UPPER HALF) A332AH3
SPRING CLIP CONNECTING LINKS FOR ASA NO 50 ROLLER CHAIN OR EQUAL
ADJUST TO 1/8
EASE ASSEMBLY 1-6850DB, ARR NO 6
CHAIN (LOWER HALF) A332AH4

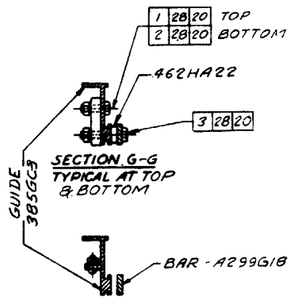
VIEW B-B
CHAIN HITCH ASSEMBLY



VIEW A-A



SECTION J-J
(AUX STOPPING SWITCH CAM & CONTACT ASSEMBLY)



SECTION H-H

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-348, SHEET 2.

Figure 8-39. Selector Assembly, Adjustable Platforms (Sheet 2 of 3)

NOTES:

NO1 - ARRANGEMENT OF SWITCHES AS SPECIFIED

NO2 - ARRANGEMENT OF CONTACTS AS SPECIFIED

NO3 - INCLUDING QUANTITY FOR FUTURE FLOOR STOPS (LISTED BELOW)

APPLYING ON		QUANTITY - FUTURE STOPS					
SELECTOR ASSEMBLY DWG NO	CONTRACT NO	6827C1	65BJ1	130R3	130Y1	130Z1	130AE1
301038-348 ARR NO1	301039	7	7	7	7	7	14
	301041	3	3	3	3	3	6
	301043	2	2	2	2	2	4
	301045	2	2	2	2	2	4
	302386	7	7	7	7	7	14
	302387	7	7	7	7	7	14
	301039	7	7	7	7	7	14
	301040	3	3	3	3	3	6
301038-348 ARR NO2	301042	2	2	2	2	2	4
	301044	2	2	2	2	2	4
	301046	3	3	3	3	3	6
	302388	7	7	7	7	7	14

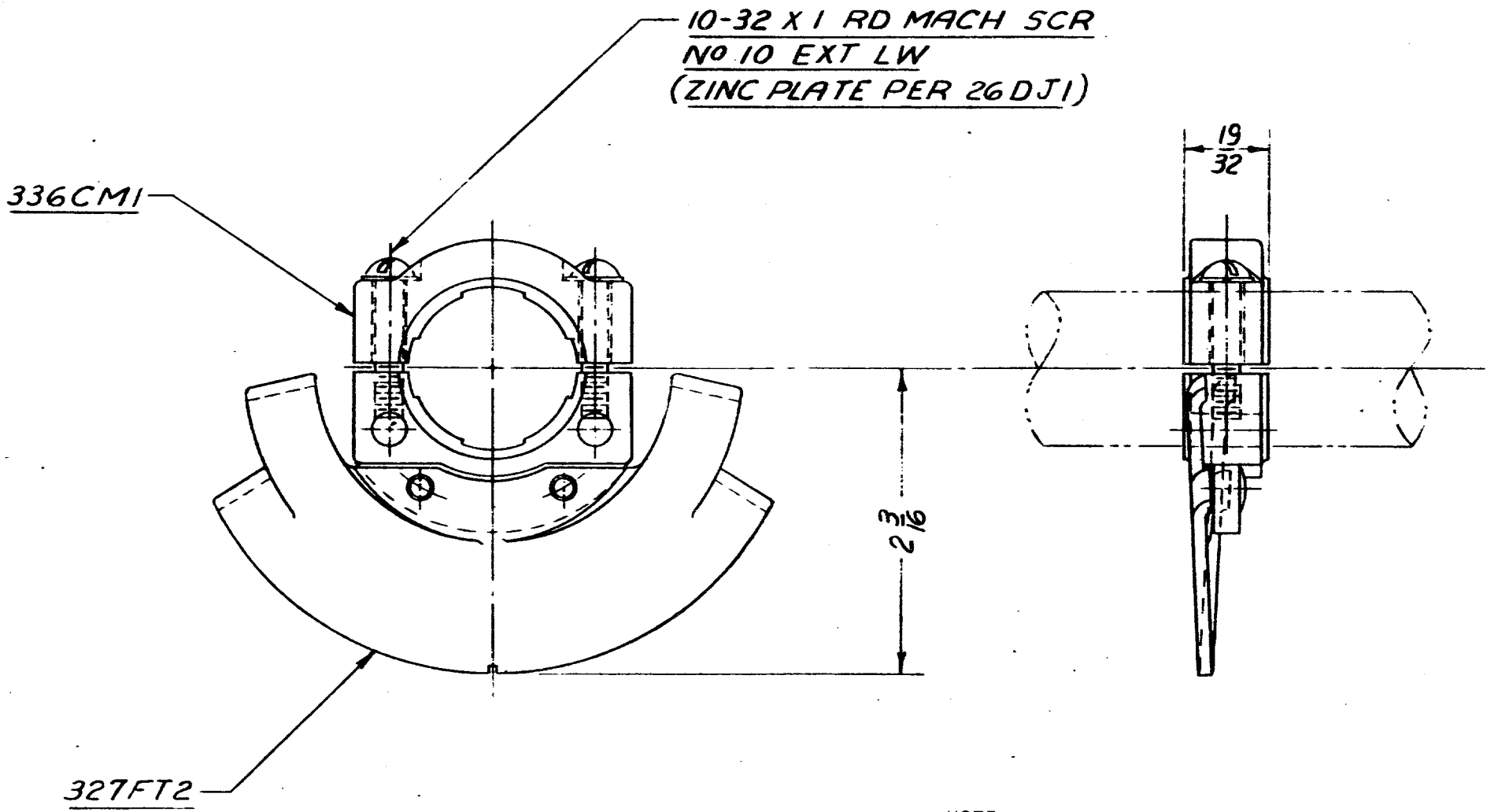
LIST OF MATERIAL --- QUANTITIES FOR ONE SELECTOR

CONTRACTOR SERVICE PART NO	NAME	NO REQ'D	MATERIAL	MATL SPEC COML	MATL SPEC OTIS	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO	UNIT WT LB	REMARKS
659993	ASSEM SPST SWITCH	1	---	---	---				
6827C1	ASSEM CAM	10	---	---	---				
6850BF, ARR NO 1	ARR LIMIT SW (TOP)	1	---	---	---				SEE NOTE NO 3
6850BF, ARR NO 2	ARR LIMIT SW (BOTT)	1	---	---	---				
6850BA, ARR NO 3	ASSEM. XHD PANEL	1	---	---	---				
6850BS	ARR FLOORS	1	---	---	---				SEE NOTE NO 1
6850CH	ASSEM AUX STOP SW	1	---	---	---				SEE NOTE NO 2
6850BL, ARR NO 2	ASSEM XHD & BRUSH ADV	1	---	---	---				
1-6850DB, ARR NO 6	ASSEM. BASE	1	---	---	---				
6851B	ASSEM. STOP CONT SW	1	---	---	---				
A6851D	ASSEM. LEV. SW	1	---	---	---				
A6850P, ARR NO 2	ASSEM CHAIN TIGHTENER	1	---	---	---				SEE NOTE NO 1
A6950P, ARR NO 4	ASSEM CHAIN TIGHTENER	1	---	---	---				MOD FOR ARR NO 1 (RIGHT HAND SEL.) REQD FOR ARR NOS 2 & 3 (LEFT HAND SEL.)
67AA1	LOCK NUT (ASSEM)	1	---	---	---				
303H1	TERM. BOARD (ASSEM)	7	STEEL	PHENOLIC	---				
316BPT2	BRACKET (ASSEM.)	1	PHENOLIC	STEEL	---				
340AX6	COLLAR (ASSEM.)	1	STEEL	---	---				
385GC3	GUIDE (ASSEM.)	1	ALUMINUM	---	---				
456BL2	ROLLER (ASSEM.)	1	CARBON	---	---				
306JM2	BASE	1	CAST IRON	ASTM 320 CLASS 20A	NO 20				SEE DWG 1-6850DB
339CB1	CLIP	6	STEEL	ASTM 303 PHOSPHOR BRONZE	NO 41A				SEE DWG 1-6850DB
1-494JB6	SHAFT	1		AISI C1045	COML				SEE DWG 1-6850DB
58XA135	BOLT (SPECIAL)	1		SAE GRADE 2	COML				
65BJ1	BOLT (PAWL)	10		AISI C1018	NO 18				SEE NOTE NO 3
6738	STOP NUT	1			COML	ESNA	2940-060		
90JC15	SPRING	1		ASTM A229	NO 3				
95AN1	STUD	1		ASTM A108	(M1)				
130R3	LOCKWASHER	10		AISI C1050	COML				
130Y1	LOCKWASHER	10		QQ-S-00692 CLASS C	NO 6				SEE NOTE NO 1
130Z1	LOCKWASHER	10	STEEL	ASTM 303 PHOSPHOR BRONZE	NO 41A				SEE NOTE NO 1
130AE1	LOCKWASHER	20		ASTM A108	NO 10				SEE NOTE NO 1
131P2	WASHER	2							SEE NOTE NO 1
141Z1	RIVET	1		---	COML				
172DE13	RETAINING RING	1				MARCES	5100-19		
172DR5	RETAINING RING	1				TRUARC	5133-9		
192E20	KEY	1							
192E25	KEY	1		AISI C1018	NO 1A				
195AY1	SPROCKET RIM	1	CAST IRON	ASTM A48 CLASS 20A	NO 20				
195CH4	SPROCKET	1	STEEL	ASTM A108	NO 10				
202BR1	BEVEL GEAR	1	CAST IRON	ASTM A48 CLASS 20A	NO 20				
207Z3	BALL BEARING	2	STEEL	---	COML				
207Z44	BALL BEARING	2				NICE	32-[illegible]		
269AH1	INDICATOR	1	VINYL						
288FZ1	LEVER	2	ALUMINUM	ALLOY 356-T6	NO 47				
A2935A	BAR	1	STEEL	ASTM A108	NO 10				
316AE2	BRACKET	1		PHENOLIC BOARD	NO 41A				
332Y9	CHAIN	1			COML	AMSO	1050		
A332AH3	CHAIN (UPPER HALF)	1							
A332AH4	CHAIN (LOWER HALF)	1							
A364AD	BALANCE WEIGHT	1	BABBITT	---	NO 1				
A346M3	COVER (TOP)	1	STEEL	ASTM A1S PHOSPHORUS	[illegible]				
A946NM4	COVER (FLOOR BARS)	1		ASTM 393 ROLLED & OILED					
A-394B10	DISK	1							
A382BK4	UPRIGHT (OPPOSITE	1	ALUMINUM	ALLOY 6063 T6	NO 41				
A382BK6	UPRIGHT (AS SHOWN	1							
A382BL7	UPRIGHT (AS SHOWN	1		ASTM A7 OR ASTM A36 BASIC.	NO 9				
A382Z3.6	UPRIGHT (OPPOSITE	1	STEEL						
A382BM5	UPRIGHT	1							
A382BN5	UPRIGHT	1							
385MK2	GUIDE	1	STEEL	AISI C1025	COML				
396BC2	HOUSING	1		ASTM A108	NO 10				
397Z1	SPROCKET HUB	1	CAST IRON	ASTM A48 CLASS 20A	NO 20				
6-A938BY2	PANEL (BOTTOM)	1	STEEL	ASTM 569 PICKLED & OILED	NO 41A				
482MA2	STEEL SPACER	2	STEEL	ASTM A108	NO 10				
482MA3	STEEL SPACER	16							
488B2	WICK	1	FELT	ASTM D346	A-2				
A494ET3	SHAFT	1		AISI C1040					
	SPRING CLIP	2	STEEL	---	COML	DIAMOND	FOR SPACES A38 & A54		
	CONNECTING LINK	3							

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-348, SHEET 3.

Figure 8-39. Selector Assembly, Adjustable Platforms (Sheet 3 of 3

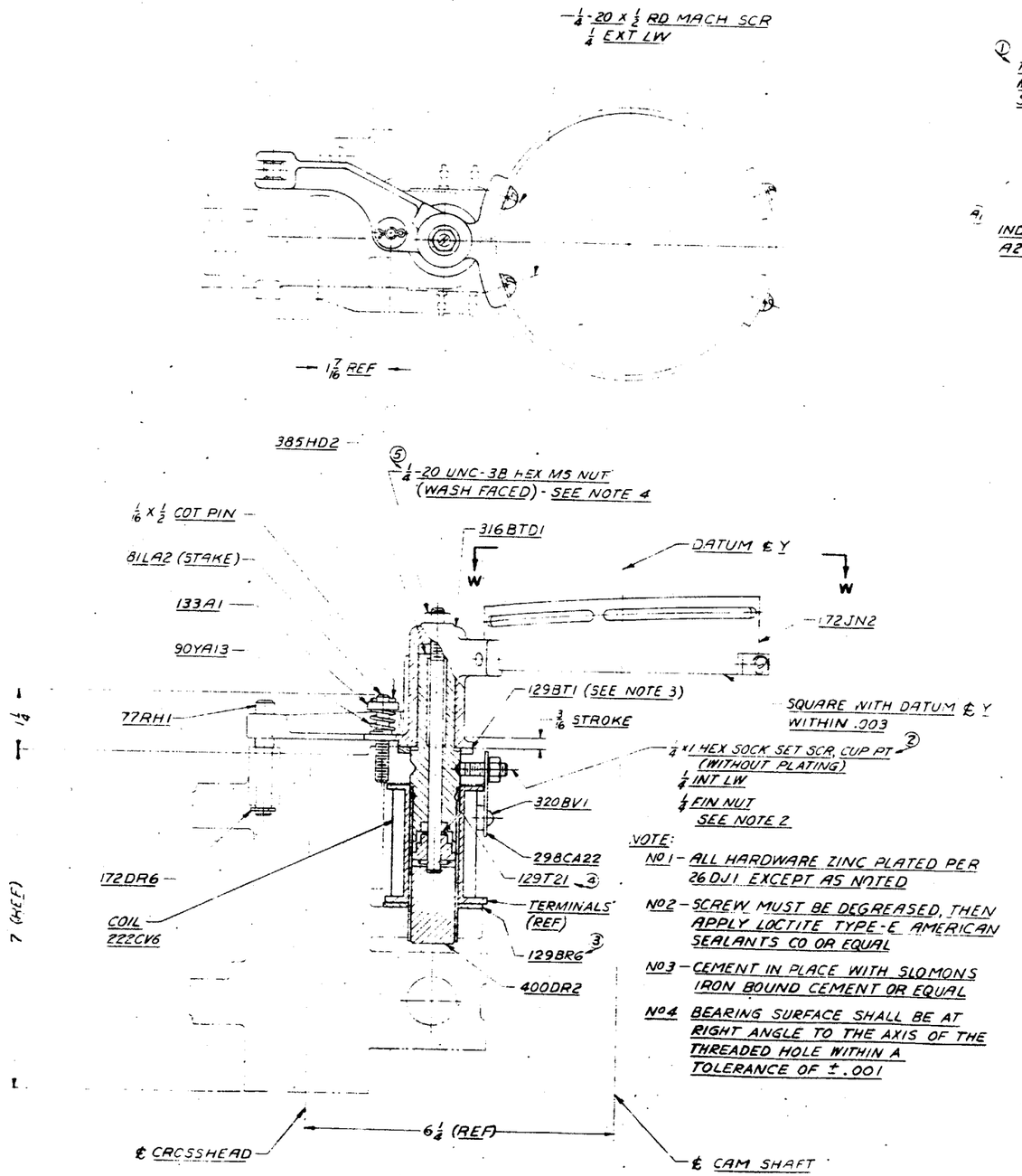


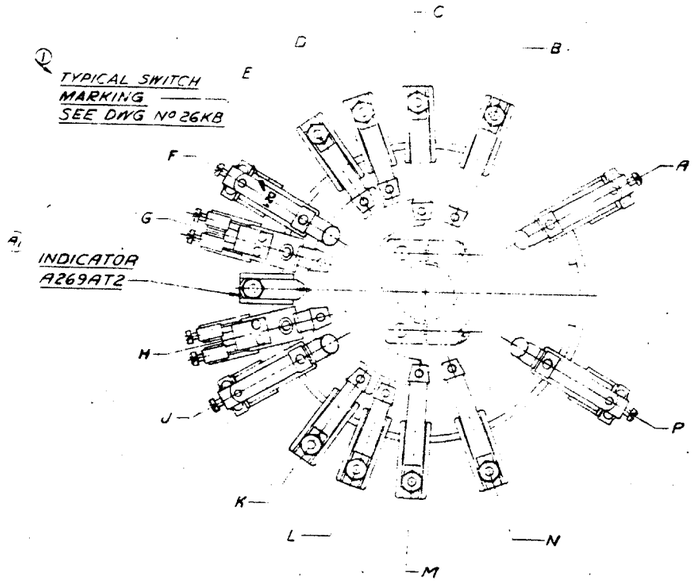
(1) PART NO 6827C1

NOTE:

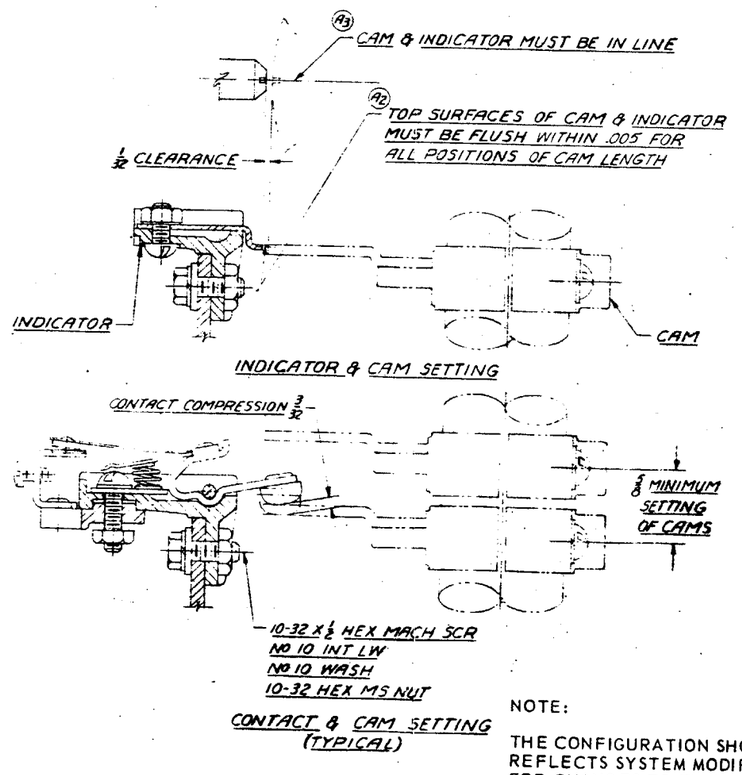
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 6827C.

Figure 8-40. Leveling Cam


1/4-20 X 1/2 RD MACH SCR
1/4 EXT LW
1 7/16 REF
385HD2
5 1/4-20 UNC-3B HEX MS NUT (WASH FACED) - SEE NOTE 4
1/16 X 1/2 COT PIN
81LA2 (STAKE)
133A1
90YA13
316BTD1
W
W
DATUM ℄ Y
172JN2
129BT1 (SEE NOTE 3)
3/16 STROKE
SQUARE WITH DATUM ℄ Y WITHIN .003
3/4 X 1 HEX SOCK SET SCR, CUP PT (WITHOUT PLATING) 2
1/4 INT LW
1/4 FIN NUT
SEE NOTE 2
320BV1
298CA22
129T21 4
TERMINALS (REF)
129BRG 3
400DR2
77RH1
172DR6
COIL 222CV6
1 1/4
7 (REF)
6 1/4 (REF)
℄ CROSSHEAD
℄ CAM SHAFT
NOTE:
NO 1 - ALL HARDWARE ZINC PLATED PER 26DJ1 EXCEPT AS NOTED
NO 2 - SCREW MUST BE DEGREASED, THEN APPLY LOCTITE TYPE-E AMERICAN SEALANTS CO OR EQUAL
NO 3 - CEMENT IN PLACE WITH SLOMONS IRON BOUND CEMENT OR EQUAL
NO 4 BEARING SURFACE SHALL BE AT RIGHT ANGLE TO THE AXIS OF THE THREADED HOLE WITHIN A TOLERANCE OF ± .001



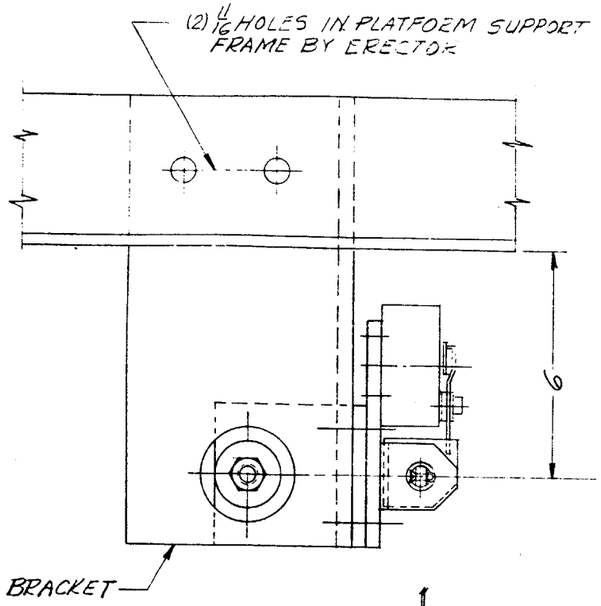
VIEW W-W

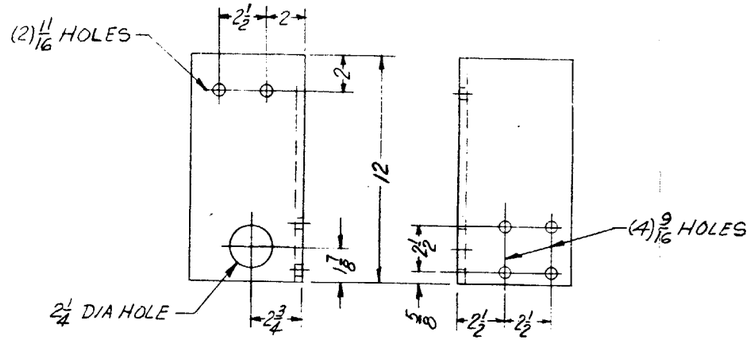

A3 CAM & INDICATOR MUST BE IN LINE
A2 TOP SURFACES OF CAM & INDICATOR MUST BE FLUSH WITHIN .005 FOR ALL POSITIONS OF CAM LENGTH
1/32 CLEARANCE
INDICATOR
CAM
INDICATOR & CAM SETTING
CONTACT COMPRESSION 3/32
3/8 MINIMUM SETTING OF CAMS
10-32 X 1/2 HEX MACH SCR
NO 10 INT LW
NO 10 WASH
10-32 HEX MS NUT
CONTACT & CAM SETTING (TYPICAL)

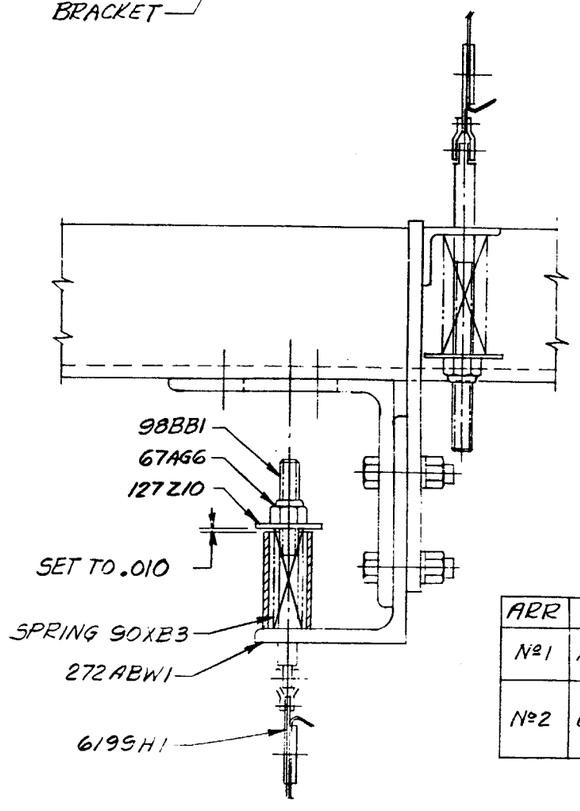
NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING A6851D.

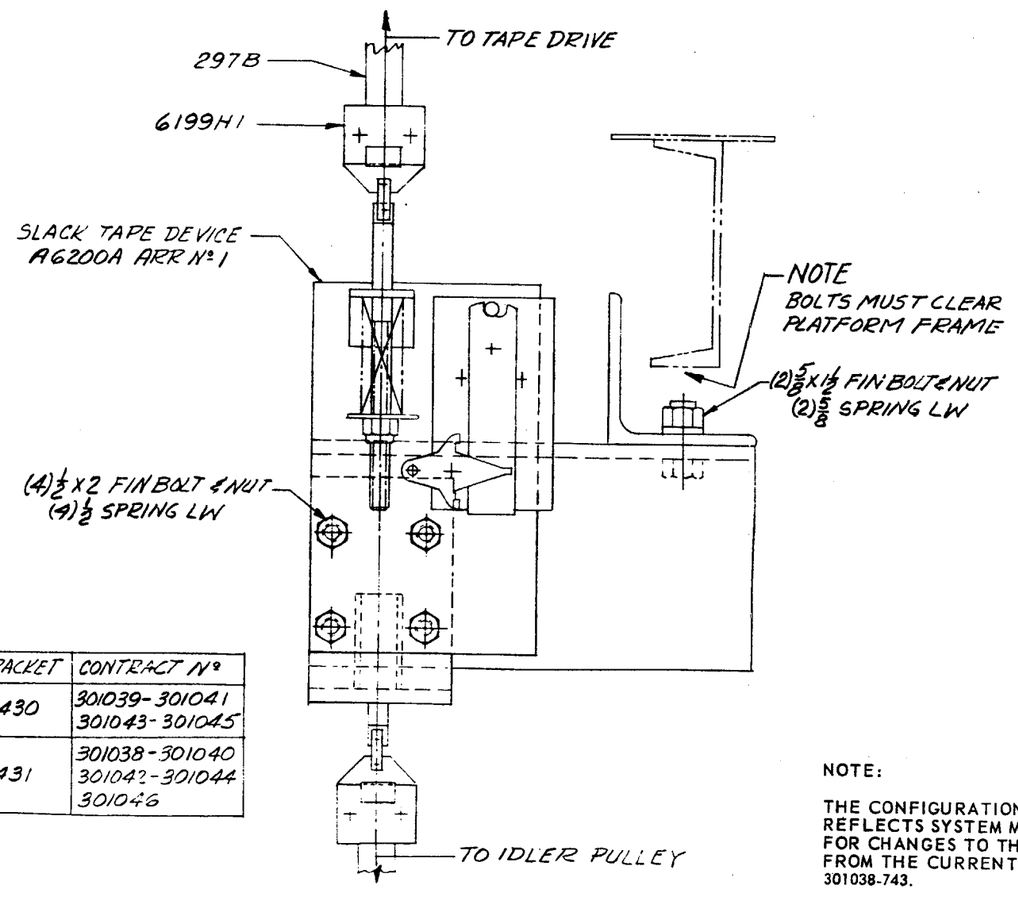
Figure 8-41. Leveling Switches







ARR	HAND	BRACKET	CONTRACT N°
N°1	AS SHOWN	430	301039-301041 301043-301045
N°2	OPPOSITE	431	301038-301040 301042-301044 301046



NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-743.

Figure 8-42. Selector Tape Hitch

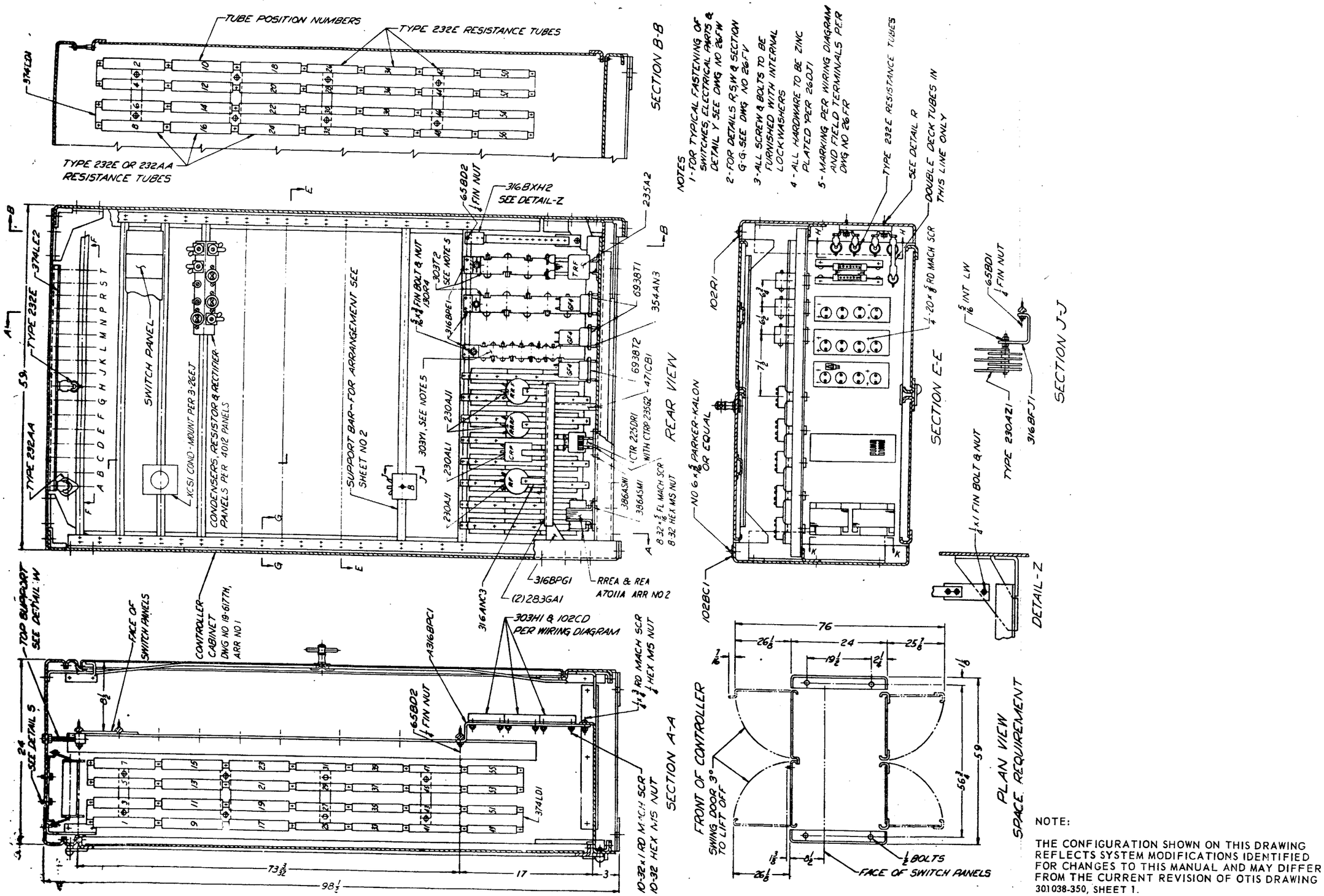
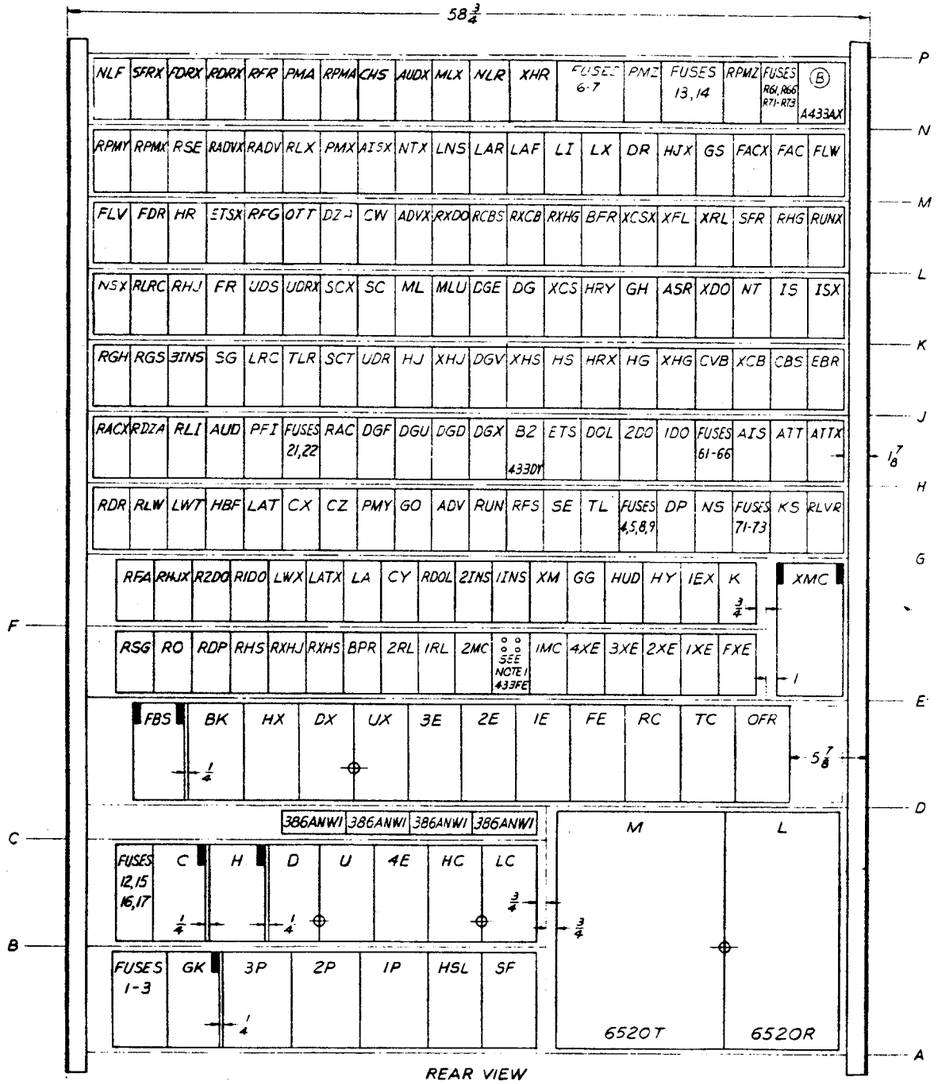

TUBE POSITION NUMBERS
TYPE 232E RESISTANCE TUBES
TYPE 232E OR 232AA RESISTANCE TUBES
SECTION B-B
NOTES
1-FOR TYPICAL FASTENING OF SWITCHES, ELECTRICAL PARTS & DETAIL Y SEE DWG NO 26FW
2-FOR DETAILS R,S,W & SECTION G-G, SEE DWG NO 26FV
3-ALL SCREW & BOLTS TO BE FURNISHED WITH INTERNAL LOCKWASHERS
4-ALL HARDWARE TO BE ZINC PLATED PER 26D71
5-MARKING PER WIRING DIAGRAM AND FIELD TERMINALS PER DWG NO 26FR
TYPE 232A
TYPE 232E
SWITCH PANEL
CONDENSERS, RESISTOR & RECTIFIER PANELS PER 40I2 PANELS
SUPPORT BAR-FOR ARRANGEMENT SEE SHEET NO 2
REAR VIEW
TOP BUSHART SEE DETAIL W
FACE OF SWITCH PANELS
CONTROLLER CABINET DWG NO 19-617H, ARR NO 1
SEE DETAIL S
SECTION A-A
TYPE 232E RESISTANCE TUBES
SEE DETAIL R
DOUBLE DECK TUBES IN THIS LINE ONLY
NO 6 PARKER-KALON OR EQUAL
SECTION E-E
FRONT OF CONTROLLER
SWING DOOR 3° TO LIFT OFF
PLAN VIEW
SPACE REQUIREMENT
DETAIL-Z
SECTION J-J
NOTE:
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-350, SHEET 1.

Figure 8-43. Main Controller (Sheet 1 of 5)


NLF SFRX FDRX RDRX RFR PMA RPMA CHS AUDX MLX NLR XHR FUSES 6-7 PMZ FUSES 13,14 RPMZ FUSES R61,R66 R71-R73 B A433AX
RPMY RPMX RSE RADVX RADV RLX PMX AISX NTX LNS LAR LAF LI LX DR HJX GS FACX FAC FLW
FLV FDR HR ETSX RFG OTT DZ-1 CW ADVX RXDO RCBS RXCB RXHG BFR XCSX XFL XRL SFR RHG RUNX
NSX RLRC RHJ FR UDS UDRX SCX SC ML MLU DGE DG XCS HRY GH ASR XDO NT IS ISX
RGH RGS 3INS SG LRC TLR SCT UDR HJ XHJ DGV XHS HS HRX HG XHG CVB XCB CBS EBR
RACX RDZA RLI AUD PFI FUSES 21,22 RAC DGF DGU DGD DGX B2 433DY ETS DOL 2DO IDO FUSES 61-66 AIS ATT ATTX
RDR RLW LWT HBF LAT CX CZ PMY GO ADV RUN RFS SE TL FUSES 4,5,8,9 DP NS FUSES 71-73 KS RLVR
RFA RHJX RZDO RIDO LWX LATX LA CY RDOL 2INS IINS XM GG HUD HY IEX K XMC
RSG RO RDP RHS RXHJ RXHS BPR 2RL IRL 2MC SEE NOTE 1 433FE IMC 4XE 3XE 2XE IXE FXE
FBS BK HX DX UX 3E 2E IE FE RC TC OFR
386ANW1 386ANW1 386ANW1 386ANW1
FUSES 12,15 16,17 C H D U 4E HC LC
FUSES 1-3 GK 3P 2P IP HSL SF
M L
6520T 6520R
58 3/4
98 1/4 CABINET
59 CABINET
299TJ68
299TJ, L=50
299TJ2
299TJ63
299TJ18
23 5/8
36 17/32 (7 SPACES 5 7/32)
73 3/32
REAR VIEW
P N M L K J H G E D A
F C B
REAR VIEW

LEGEND:

⊕ INDICATES MECHANICAL INTERLOCK

INDICATES BO COIL

NOTES:

1. ASSEMBLE PANEL PER DWG NO 6164BT
2. FOR SECTION K-K SEE DWG NO 26FV

RESISTANCE TUBE LAYOUT

A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T
MF	MF	MF	MF	MF	MF	FBR	FBR	FBR	FBR	FBR	GF	GF	GF	GF	GF	GF

VIEW F-F

TUBE POSITION NOS

1 GF1	3 GF1	5 GF1	7 GF1
9 GF1	11 GF1	13 GF1	15 MAG
17 GF1	19 GF1	21 GF1	23 MAG1
25 GFC	27 GFC	29 GFC	31 MF1
33 GFC	35 GFC	37 RFR	39 GF7
41 GCF1	43 GCF2	45 RFR1	47 RFR2
49 DM	51 RDM1 DM1	53 RDMF DMF	55 RDM

VIEW K-K

7 B	6 B	4 GF	2 GF
16 B	14 B	12 GF2	10 GF
24 DFR1	22 B	20 LFR	18
32 OFR	30 RBM1	28 LFR	26 LFR
40 EF	38 EF	36 LFR	34 LFR
48 B1	46 RBM	44 LFR	42 LFR
56 B4	54 BM1	52 BM	50 SUR

VIEW H-H

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-350, SHEET 2.

Figure 8-43. Main Controller (Sheet 2 of 5)

LIST OF MATERIAL — QUANTITIES FOR ONE

CONTRACTOR'S SYMBOL NO	SERVICE PART NO	NAME	ARR NO	NO REQ'D	MATERIAL	MATL SPEC COML	MATL SPEC OTIS		REMARKS
	19-6177H ARR NO 1	CONTROLLER CABINET	1						
	299TJ68	SUPPORT BAR	11		STEEL	COLD ROLLED, NO 2 EDGE	SPEC NO 16		
	299TJ, L=50	SUPPORT BAR	1		STEEL	COLD ROLLED, NO 2 EDGE	SPEC NO 16		
	299TJ2	SUPPORT BAR	1		STEEL	COLD ROLLED, NO 2 EDGE	SPEC NO 16		
	299TJ63	SUPPORT BAR	2		STEEL	COLD ROLLED, NO 2 EDGE	SPEC NO 16		
	299TJ18	SUPPORT BAR	1		STEEL	COLD ROLLED, NO 2 EDGE	SPEC NO 16		
	315DB1	CLIP	7		STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		
	65BD1	BOLT							
	374LD1	RES TUBE FRAME	2		STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		
	374LE2	FRAME	1		STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		
	316ANC3	BRACKET	4		STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		FOR RECTIFIERS RF, RRF, RRRF
	316BFJ1	BRACKET			STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		FOR 230AZ1 RECT
	A316BPC1	BRACKET	8		STEEL	AISI C1020	SPEC NO 2		
	316BPE1	BRACKET	3		STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		
	316BPG1	BRACKET	1		STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		
	316BXH2	BRACKET	1		STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		
	386ASM1	PLATE	1		STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		
	386ASN1	PLATE	1		STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		FOR REA & RREA REACTORS
	354AN3	SPACER	12		STEEL		SPEC NO 10		
	471CB1	STAND	1		STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		
	283GA1	FORMED ANGLE	2		STEEL	HOT ROLLED & PICKLED	SPEC NO 41A		
	102R1	PATENT PLATE	1						
	102BC1	NAME PLATE	1						
	102CD	MARKING PLATE	24		WHITE SPAGLE		VINYL MATTE FINISH		FOR TERM BLOCK 303H1
	303H1	TERMINAL BLOCK	24		PHENOLIC	BAKELITE 2498	SPEC NO 1		SEE NOTE 5
	303T2	TERMINAL BOARD	2			NEMA GRADE CE	SPEC NO 11		
	303Y1	TERMINAL BOARD	1						
RF, RRF, RRRF	230AJ1	RECTIFIERS	3						
CRF	230AL1	RECTIFIER	1						
TRF	235A2	TRANSFORMER	1						
CTR	225DR1	TRANSFORMER	1						
CTRP	235G2	TRANSFORMER	1						
RREA, REA	A7011A, ARR NO 2	REACTORS	2						
	6938T1	DAMPING COND PANEL	2						
	6938T2	DAMPING COND PANEL	1						
H, 1RL, 2RL, NS, XDO, IS, HJ, HS, HS1, CBS, CBS1, CVB, SG, SCT, ISCT, 2SCT, U1, D1, RU1, RD1, PM, RPM, SE, RSE, RFS, RHS, RHS1, RHJ, DP, RDP, RSG, HS2, RHS2, FR1, FR2, FR3, RF1, RF2, RF3, RGH, GH, RCBS, RCBS1, U, D, U2, D2, 4E, LNS, SGM1, SGM2, SGM3, SGM4	230AR1	RECTIFIERS	53						
B1	230AR2		1						
B	230AZ1		1						
MAG, MAG1	232AA4	RESISTORS	2						
GFC1, GFC2	232E44		2						
DM, DM1, RDM, RDM1	232E30		4						
GF7, EF	232E25		3						
CRF, CRF1, CFR2, PM, PM1, RPM, RPM1	232B171		7						
C, NS, RSE1, SE1, TL, 1UDS, 2UDS, XCS2,	232B177		8						
HS, HJ1, RHS, RHJ1	232B176		4						
EHT1, H, FXE1, 1XE1, 2XE1, 3XE1, 4XE1, 1RL1, 2RL1, LWT1, NT1, 2D01, R2D01, XD01, XMC1	232B220		15						
DG, PF1, RF5	232B170		3						
RSE, SE	232B172		2						
DMF, RDMF, DFR	232E47		3						
B1, LFR	232E42		2						
GF, SUR	232E31		2						
LV, RLV	232B167		2						
BM, RBM	232E39		2						
BM1, RBM1	232E164		2						

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING **301038-350, SHEET 3.**

Figure 8-43. Main Controller (Sheet 3 of 5)

LIST OF MATERIAL — QUANTITIES FOR ONE

CONTRACTOR'S SYMBOL NO	CONTRACTOR'S SERVICE PART NO	NAME	NO REQD ARR NO II	MATERIAL	MATL SPEC COML	MATL SPEC OTIS		REMARKS
RLRC, LRC	232B169		2					
MF, GF, GF1	232AA32		9					
GF, GF1	232AA34		3					
B, GF	232AA36		2					
B, GF, LFR	232AA38		3					
GF, GFC	232E7		2					
GFC, LFR	232E129		2					
B4	232E33		1					
MF1	232E9		1					
GFC	232E45		1					
	232E134		1					
	232E155		1					
LFR	232E5		1					
	232E125		1					
	232E151		1					
RFR	232E190		1					
RFR1	232E18		1					
RFR2	232E191		1					
B	232E27	RESISTORS	2					
	232AA48		1					
MF	232AA3		2					
	232AA15		1					
	232AA35		1					
OFR1	232AA17		1					
LFR	232AA9		1					
GF1	232AA18		2					
	232AA33		1					
	232AA37		1					
	232AA46		1					
GF2	232AA12		1					
FBR	232AA16		5					
LAT1	232AH1		1					
CTG	232AH3		1					
B3	232B165		1					
K	232BA28		1					
DCB	232Y31		1					
CFL2	232Y42		1					
CFL	232Y56		1					
1, 2, 3	375J10		3					
4, 5, 12, 15	375H10		4					
8, 9, 16, 17	375H3		4					
13, 14	375H60		2					
21, 22	375H1	FUSES	2					
61, 65, 66, R61, R66	375P1		5					
62, 63, 64	375T1		3					
71, R71	375P6		2					
72, R72	375P3		2					
73, R73	375P4		2					
	6843E		1					FOR FUSES 1-3
	6843H, ARR 6		1					FOR FUSES 4,5,8,9
	6843C, ARR 5		1					FOR FUSES 12,15,16,17
	6843AH		1					FOR FUSES 13, 14
	6843A, ARR 2	FUSE PANELS	1					FOR FUSES 21, 22
	6843AD		1					FOR FUSES R61, R66, R71-R73
	6843AD, ARR 6		1					FOR FUSES 61-66
	6843AD, ARR 7		1					FOR FUSES 71-73
	433FE2	STUD PANEL	1					
	310FH1	BLOCK	1		STEEL	AISI C1018	SPEC NO 10	
	96H	STUD	1		STEEL	AISI C1020	SPEC NO 2	
	399BY1	CLIPS						
	399BY2							
	65BD2	BOLT						
	386ANW1	PLATE	4		STEEL		SPEC NO 41A	
	180AD1	TUBE CLIP						
	6543F1	MECH INTERLOCKS	1					FOR SWITCHES L & M
	PER DWG 6543C		3					FOR SWITCHES U & D, UX & DX, HC & LC
SAB	A6704C1	BUTTON	1					
KS	177E1	KNIFE SWITCH	1					MARK UPPER PART NORMAL
	6369G ARR NO 3 WITH COIL 224H1	SHUNT	1					MOUNT ON SF SWITCH

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-350, SHEET 4.

Figure 8-43. Main Controller (Sheet 4 of 5)

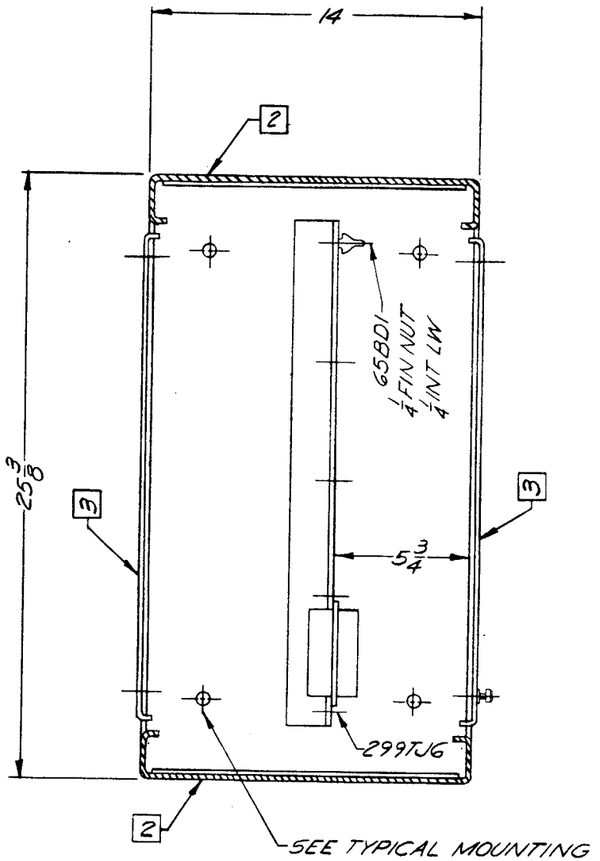
LIST OF MATERIAL —— QUANTITIES FOR ONE

CONTRACTOR'S SYMBOL NO	CONTRACTOR'S SERVICE PART NO	NAME	NO REQ'D	MATERIAL	MATL SPEC OM	MATL SPEC OTIS		REMARKS
BM, BFR, CFL, LI, RBM	226D1	CONDENSERS	5					
B1, B2	226D2		4					
D,U,HX,HSL,TL1	226D3		5					
DGE, DGV, ISX	226H1		3					
L,H,DP,NT,EHT, ETS,IRL,2RL,PRC RDP,XMC	226H2		16					
SG,ASR,ETS,LVI, 2DO,R2DO,RSG. SCT	226H3		8					
L,CZ,DP,NT,CVB, EHT,LAT,LWT,IRL, 2RL,1XE,2XE,3XE, FXE,RDP,XDO,XMC	226H4		17					
4XE	226H5		1					
HG,HJ,RHJ,CFL1	226H6		4					
B,GF4	226W							
XCS1	226W2		1					
DG	A6164BP-332-CX1		1					
ASR, DGE, DGV	A6164BP-132-CX2		3					
AIS, LWX	A6164BP-114-CY1		2					
IXE	A6164BP-122-CY1		1					
GQ,SC,SG,BPR,LAT,X WD,2INS,RUN,PMY SCT, 2XE DR,XHR	A6164BP-123-CY1		13					
AUDX	A6164BP-111-CY1		1					
GG,CBS,3INS	A6164BP-131-CY1		3					
NLF,FDRX, K,CZ,NT,ADV,DGD, RDRX,RFR, DGF,DGU,DGX,DOL, PMA,MLX,NLR,EBR,ETS,HBF,HRX, RFG,OTT,SCX,MLU,LAT,IRL,2RL, UDR,UDRX,	A6164BP-132-CY1		33					
HJX, RHJX	A6164BP-120-CY1		2					
DP, RXDO	A6164BP-140-CY1		2					
CX,CY,GH,HY,LA,ML, NS,TL,XM,IEX,TLR, XCS,XDO,RPMA.	A6164BP-141-CY1		14					
CHS ATF,ATTX,LRC,LWT	A6164BP-150-CY1		5					
IDO	A6164BP-114-CY2		1					
HG,2DO,IS	A6164BP-132-CY2		3					
ISX	A6164BP-141-CY2	SWITCHES	1					
UDS	A6164BP-623-CZ1		1					
HS	A6164BP-650-CZ2		1					
SE	A6164BP-741-CZ2		1					
PFI	A6164BP-323-CZ3		1					
HJ	A6164BP-623-CZ5		1					
ZMC	A6164BP-411-222DS1		1					
IMC	A6164BP-411-222DS5		1					
BK,1E,2E,3E,4E, HC,LC,HSL	B6754A-122-CD1		8					
FBS	B6754A-726-CD1		1					
FE	B6754A-122-CD2		1					
DX,UX	B6754A-122-CD3		2					
D,U	B6754A-122-CD4		2					
H	B6754A-125-CD4		1					
GK	B6754C-125-CD2		1					
RC,TC	B6754C-162-CD2		2					
C	B6754C-165-CD2		1					
HX	B6754C-162-CD3		1					
SF	A6754D-100-CD2		1					
OFR	6754Y-160-CD3		1					
XMC	A6B30B-744-CV1		1					
XCB,XHG,XHJ,XHS	6840E, ARR NO1	THYRATRON PANELS	4					
1P, 2P, 3P	6315J	OVERLOAD RELAYS	3					
B	230AZ1	RECTIFIER	1					COIL PER 18010
CVB	6842J	RELAY	1					
	433DY	PANEL						FOR B2 RESISTOR
L	6520R-241-AF3	SWITCHES	1					
M	6520T-281-AF4		1					
SFRX	A6164BP-104-CY1		1					

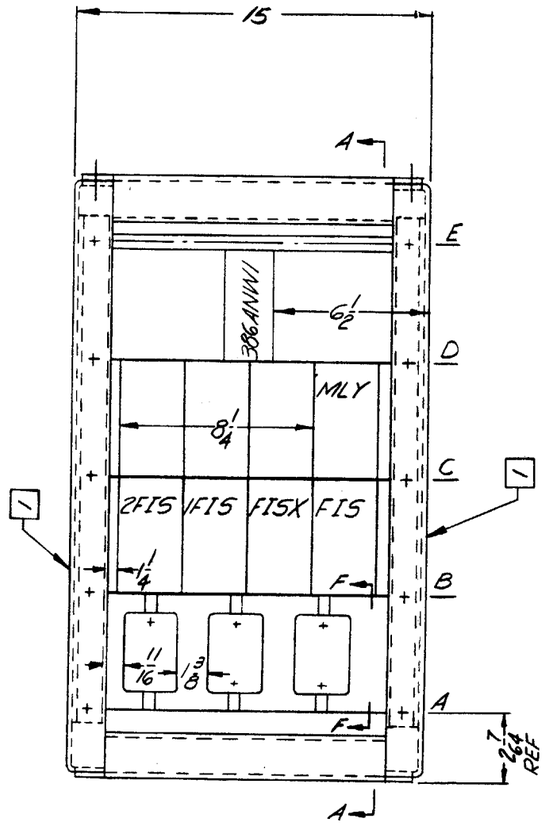
NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-350, SHEET 5.

Figure 8-43. Main Controller (Sheet 5 of 5)



SECTION A-A



REAR VIEW

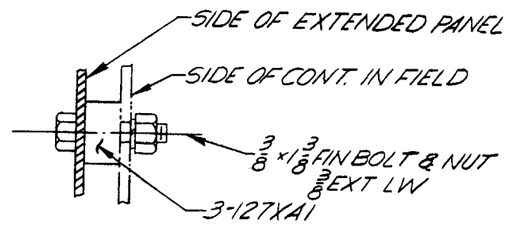
PANEL 1 302386-303 NOT SHOWN

NOTES:

FOR TYPICAL FASTENINGS OF ELEC. PARTS SEE DWG NO. A26CD.

FOR SECTION F-F SEE DWG. NO. 5-303H

ITEM NOS. 1 THRU 3 PER DWG NO. 302386-303



TYPICAL MOUNTING OF EXTENDED PANEL

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-302, SHEET 1.

Figure 8-43A. Main Controller, Extended Panel for Emergency Service (Sheet 1 of 2)

Revised 1 March 1968

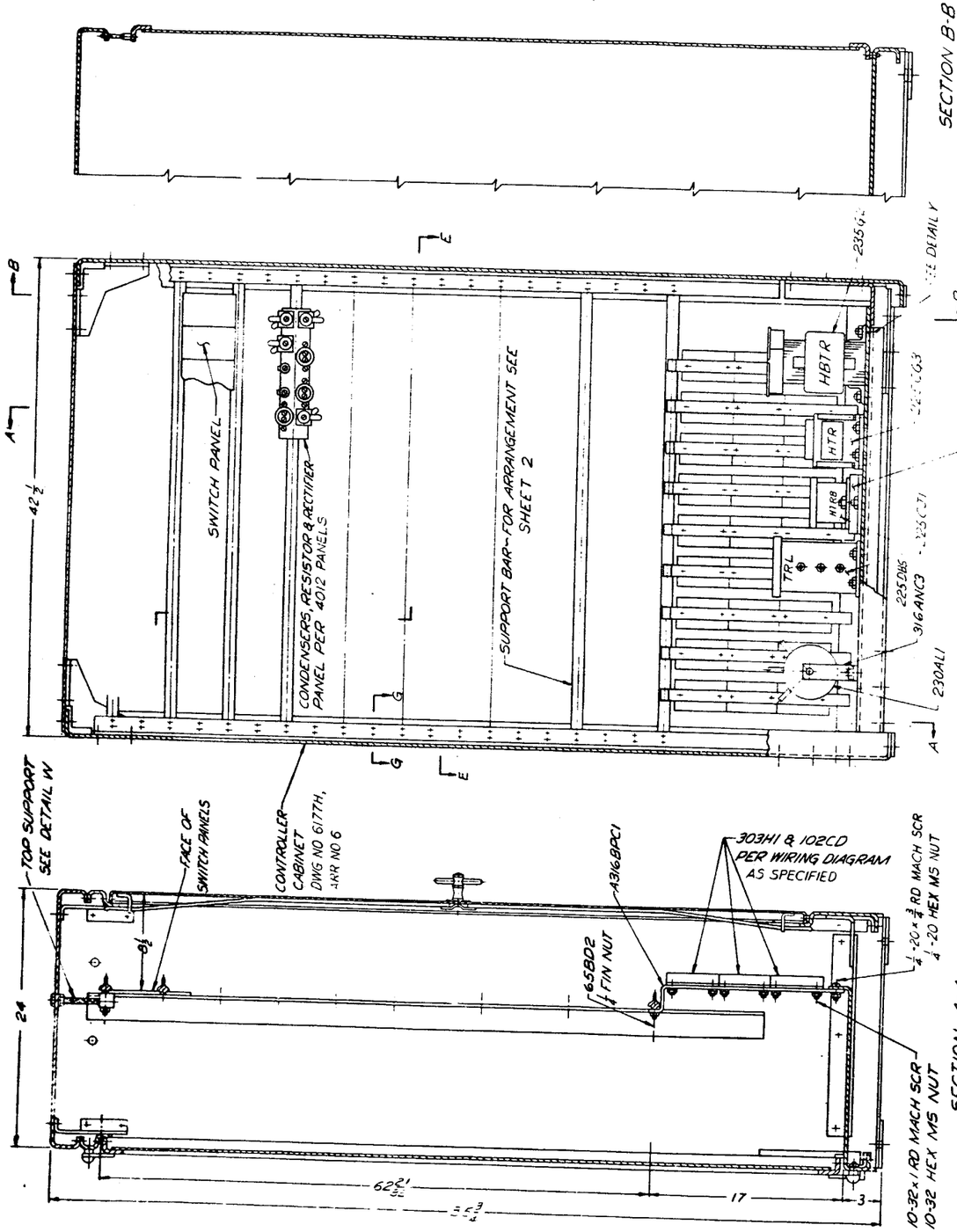
LIST OF MATERIAL —— QUANTITIES FOR ONE

ITEM OR FIND Nº	NAME	NO. REQ'D		MATERIAL	MATL. SPEC. GOVT.	MATL. SPEC. COM'L.	MATL. SPEC. OTIS	CONTRACTOR DWG. NO.	CONTRACTOR SERVICE PART NO.	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO.	UNIT WT. LB.	REMARKS
1	UPRIGHT	2		STEEL		HOT ROLLED & PICKLED	41A	302386-303	1 302386-303				
2	BRACE	2							2 302386-303				
3	PANEL	2							3 302386-303				
4	BRACE, UPRIGHT	2							4 302386-303				
299TJG	SUPPORT BARS	5		STEEL		COLD ROLLED NO 2 EDGE	16	299TJ	299TJG				
339BY2	CLIPS	20		STEEL		HOT ROLLED & PICKLED	41A	339BY	339BY2				
303H1	TERMINAL BLOCK	6		PHENOLIC		BAKELITE-2488	1	303H	303H1				
102CD	MARKING PLATE	1		WHITE OPAQUE		VINYL MATTE FINISH		102CD	102CD				FOR 303H BLOCKS
298HV1	STRAP	1		STEEL		HOT ROLLED & PICKLED	41A	298HV	298HV1				
386ANW1	PLATE	1		STEEL		HOT ROLLED & PICKLED	41A	386ANW	386ANW1				
65BD1	BOLT	20		STEEL		AISI-C1013, C1020 OR C1030		65BD	65BD1				
65BD2		30							65BD2				
3-127XA1	WASHER	4		STEEL		COLD ROLLED		3-127XA	3-127XA1				
129CA4		8		FIBRE			1	129CA	129CA4				
117F1	SCREW, KNURLED HEAD	8		STEEL		CADMIUM PLATED		117F	117F1				
FIS 1FIS F1SX	SWITCHES	3						AG16ABP	AG16ABP-123-CY1				
MLY		1							AG16ABP-132-CY1				
2FIS		1							AG16ABP-150-CY1				
72BX3	SPEED NUT	8		STEEL				72BX	72BX3				SOUTH CHESTER CORP # 11027-11-67

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-302, SHEET 2.

Figure 8-43A. Main Controller, Extended Panel for Emergency Service
(Sheet 2 of 2)



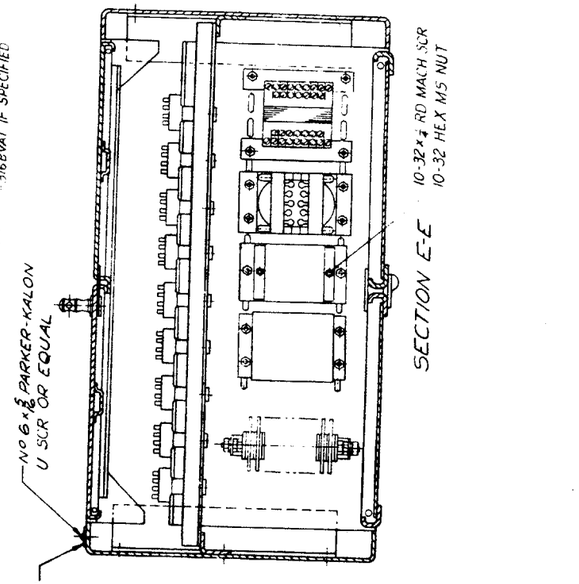
NOTES

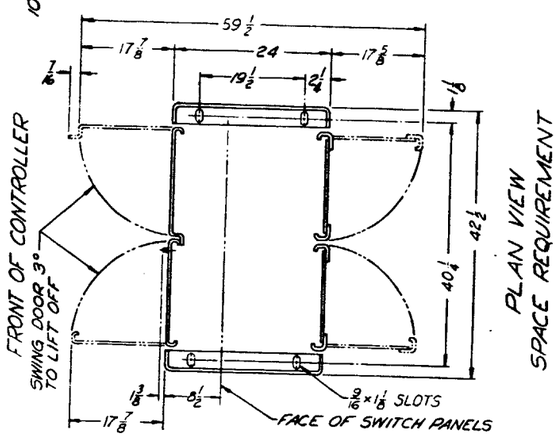
1-FOR TYPICAL FASTENING OF SWITCHES, ELECTRICAL PARTS & DETAIL Y SEE DWG NO 26FW

2-FOR DETAIL W & SECTION G-G SEE DWG NO 26FV

3-ALL SCREW & BOLTS TO BE FURNISHED WITH INTERNAL LOCKWASHERS

4-ALL HARDWARE TO BE ZINC PLATED PER 26DJ1

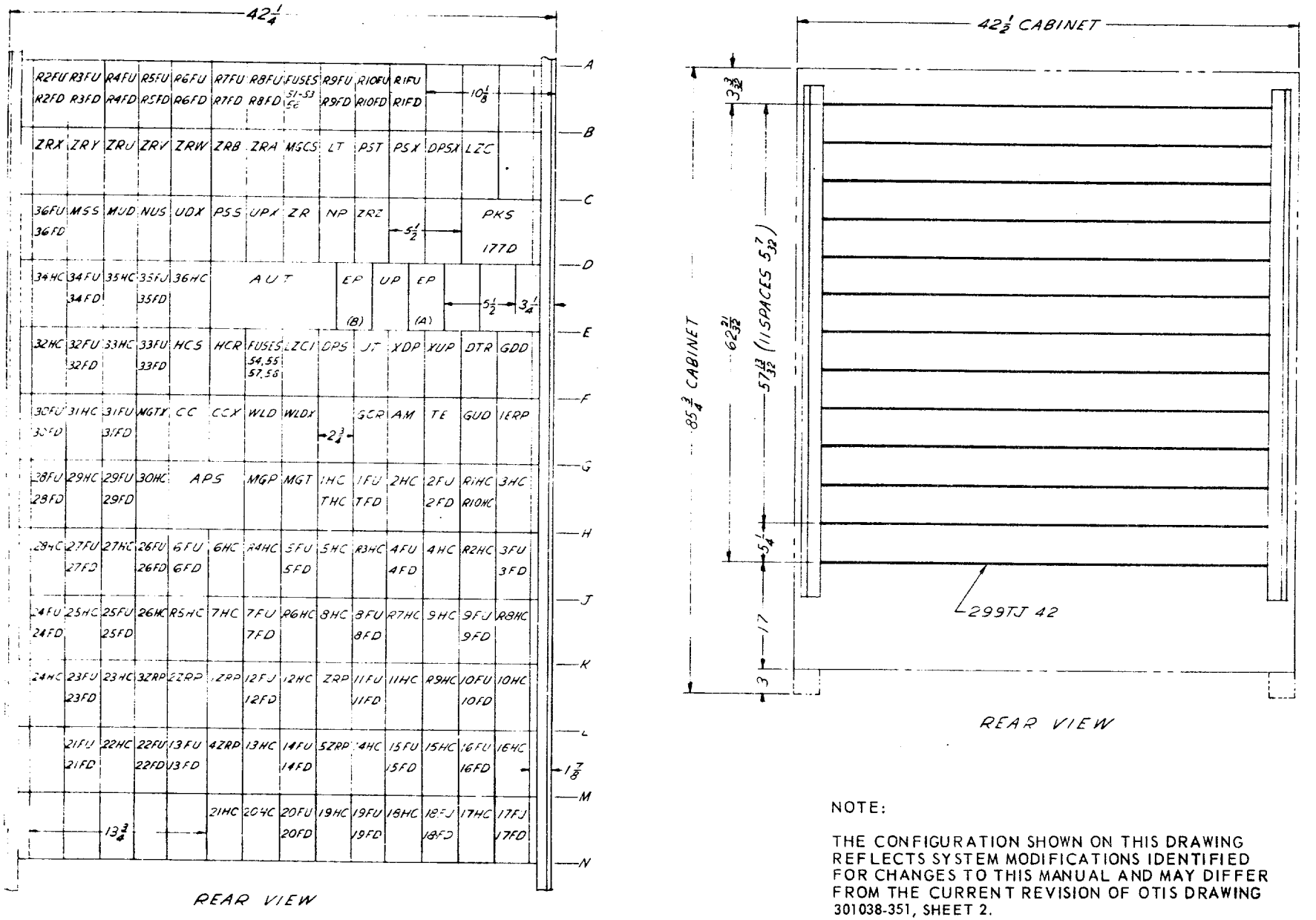




NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-351, SHEET 1.

Figure 8-44. Dispatching and Electronic Controller (Sheet 1 of 4)


42 1/4
R2FU R3FU R4FU R5FU R6FU R7FU R8FU FUSES R9FU R10FU R1FU
R2FD R3FD R4FD R5FD R6FD R7FD R8FD 51-53 55 R9FD R10FD R1FD
10 1/8
ZRX ZRY ZRU ZRV ZRW ZRB ZRA MSCS LT PST PSX DPSX LZC
36FU MSS MUD NUS UDX PSS UPX ZR NP ZRZ PKS
36FD 177D
5 1/2
34HC 34FU 35HC 35FU 36HC AUT EP UP EP
34FD 35FD (B) (A)
5 1/2 3 1/4
32HC 32FU 33HC 33FU HCS HCR FUSES LZCI OPS JT XDP XUP DTR GDD
32FD 33FD 54,55 57,58
30FU 31HC 31FU WGTX CC CCX WLD WLDX GCR AM TE GUD IERP
30FD 31FD
2 3/4
28FU 29HC 29FU 30HC APS MGP MGT 1HC 1FU 2HC 2FU R1HC 3HC
28FD 29FD THC TFD 2FD R10HC
26HC 27FU 27HC 26FU 6FU 6HC R4HC 5FU 5HC R3HC 4FU 4HC R2HC 3FU
27FD 26FD 6FD 5FD 4FD 3FD
24FU 25HC 25FU 26HC R5HC 7HC 7FU R6HC 8HC 8FU R7HC 9HC 9FJ R8HC
24FD 25FD 7FD 8FD 9FD
24HC 23FU 23HC 3ZRP 2ZRP 1ZRP 12FJ 12HC ZRP 11FU 11HC R9HC 10FU 10HC
23FD 12FD 11FD 10FD
21FU 22HC 22FU 13FU 4ZRP 13HC 14FU 5ZRP 14HC 15FU 15HC 16FU 16HC
21FD 22FD 13FD 14FD 15FD 16FD
1 7/8
13 3/4
21HC 20HC 20FU 19HC 19FU 18HC 18FJ 17HC 17FJ
20FD 19FD 18FD 17FD
A B C D E F G H J K L M N
REAR VIEW
42 1/2 CABINET
3 3/32
85 3/4 CABINET
62 21/32
57 13/32 (11 SPACES 5 7/32)
5 1/4
17
3
299TJ 42
REAR VIEW

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-351, SHEET 2.

Figure 8-44. Dispatching and Electronic Controller (Sheet 2 of 4)

LIST OF MATERIAL — QUANTITIES FOR ONE

CONTRACTOR'S SYMBOL	CONTRACTOR'S SERVICE PART NO	NAME	ASSY NO	NO REQ'D	MATERIAL	MATL SPEC COM'L	MATL SPEC OTIS	REMARKS
	6177H ARRW06	CONTROLLER CABINET	1					
	299TJ42	SUPPORT BAR	13		STEEL	COLD ROLLED, NO2 EDGE	SPEC NO16	
	65BD1	BOLT	20					
	65BD2	BOLT	180					
	303HI	TERMINAL BLOCK	27			BAKELITE 2498	SPEC NO1	
	102CD	MARKING PLATE	27		WHITE OPAQUE		WHT. MATTE FINISH	
	102BC1	NAME PLATE	1					
	A316BPC1	BRACKET	9		STEEL	AISI C1020	SPEC NO2	
CC1	232B174	RESISTORS	1					MOUNTED PER 4012 PANELS
MGT1	232B174							
WLD1	232B177							
HFL	232Y25							
HFL2	232Y53							
HFL3	232B163							
HTG	232AH3							
TE	232BA23							
TE1	232BA24							
TE2	232B167							
TE3	232B165							
CC.	226H4	CONDENSERS		1				MOUNTED PER 4012 PANELS
CCX	226H3			1				
MGT	~~226H2~~ 226H3			1				
MGTX	226H3			1				
WLD	~~226H2~~ 226H4			1				
HCR	226H5			1				
HFL	226H2			1				
HFL1	226D1			1				
HFL3	226H2			3				
TE	226D2			1				
AUT	226H4			1				
DTR	226H3			1				
GDD	226H3			1				
NUS	~~226H4~~ 226H2			3				
CC	6840J4	SWITCHES		1				
GCR	A6164BP-132-CY1							
GUD	A6164BP-114-CY1							
HCS	A6164BP-123-CY1							
MGP	A6164BP-114-CY1							
MGT	6840J3							
MGTX	A6164BP-150-CY1							
WLD	B6842G1							
WLDX	A6164BP-141-CY1							
AM	6842H2							
CCX	A6164BP-123-CY1							
HCR	B6842B3							
PKS	177D1							
TE	A6843Y							
THC-1HC & ETC.	A6843R21			37				
PSS	B6842G1							
PST	6840P							
PSX	A6164BP-114-CY1							
UT	B6842B4							
AUT	B6840AA							
APS	6840Y1			1				
DPS	A6164BP-114-CY1							
XDP	B6842B4							
UP	A6164BP-141-CY1							
XUP	B6842B4							
DTR	B6842B4							
GDD	A6164BP-132-CY1							
	339BY2	CLIP		180				
	130R3	WASHER		180				

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-351, SHEET 3.

Figure 8-44. Dispatching and Electronic Controller (Sheet 3 of 4)

LIST OF MATERIAL —— QUANTITIES FOR ONE

CONTRACTOR'S SYMBOL	CONTRACTOR'S SERVICE PART NO	NAME	ARR NO	NO REQ'D	MATERIAL	MATL SPEC COM'L	MATL SPEC OTIS		REMARKS
DPSX	A6164BP-132-CY1	SWITCHES	1						
LZC	B6842B2								
LT	A6164BP-123-CY1								
MSS	A6164BP-132-CY1								
MUD	A6164BP-120-CY1								
NUS	A6164BP-114-CY1								
UDX	A6164BP-132-CY1								
UPX	A6164BP-122-CY1								
ZR	A6164BP-132-CY1								
ZRX	A6164BP-114-CY1		1						
ZRY									
ZRJ									
ZRV									
ZRN									
ZRA									
ZRB									
MGCS	300753-377	KEY SWITCH	1						
R1HC-R10HC	A6843R21	SWITCH	10						
1FU-TFD	6841C2	SWITCH	1						
2FU-2FD & ETC	6841C1	SWITCH	35						
R1FJ-R10FD	6841C2	SWITCH	1						
R2FJ-R2FD&ETC	684.C.	SWITCH	8						
1ERP	6843A4	RECTIFIER PANEL	1						
LZC1	2-A6840AA	RESISTOR PANEL	1						
ZRP 1ZRP-5ZRP	6843AL3	RESISTOR & RECTIFIER PANEL	6						
54	375H3	FUSE	1						
55	375H6	FUSE	1						
57.58	375H10	FUSE	2						
51-53	375T1	FUSE	3						
56	375P2	FUSE	1						
	6843H6	FUSE PANEL	1						FOR 54,55 57.58
	6843AD1	FUSE PANEL	1						FOR 51 TO 53 & 56
TRL	225DB1	TRANSFORMER	1						
HBTR	235G2	TRANSFORMER	1						
HTR	225CG3	TRANSFORMER	1						
HTRB	225CJ1	TRANSFORMER	1						
HBRF	230AL1	RECTIFIER	1						
	425-45	ELEC. TUBE SPARES	2						
	TYPE 115 NO 10	AMPERITE	1						
HCR	230AR2	RECTIFIER	1						
1ERP1-1ERP8	230BD4	RECTIFIER	8						

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-351, SHEET 4.

Figure 8-44. Dispatching and Electronic Controller (Sheet 4 of 4)

LIST OF MATERIAL —— QUANTITIES FOR ONE HALL POSITION INDICATOR

CONTRACTOR SERVICE OR PART NO.	NAME	NO. REQD	MATERIAL	MATL SPEC COML	MATL SPEC OTIS	MANUFACTURER NAME	MANUFACTURER SERVICE PLANT OR DIVISION	UNIT WT LB	REMARKS
1 301038-331	BOX	1	STAINLESS STEEL	ASTM A167	NO 81				
2 301038-332	FACE PLATE	1	STEEL						
3 301038-333	BASE PLATE	1	STEEL	QQS-00692 CL-C	NO 16				
4 301038-333	BASE PLATE	1	STEEL	QQS-00692 CL-C	NO 16				
5 301038-333	BASE PLATE	1	STEEL	QQS-00692 CL-C	NO 16				
6 301038-333	BASE PLATE	2	STEEL	QQS-00692 CL-C	NO 16				
6644A	LAMP RECEPTACLE	49							
6599D8	INCANDESCENT LAMP	49							
278AD1	LIGHT SHIELD	49	PHENOLIC	——	NO 1				
——	10-32 × 1/2 PHILLIPS OVAL MACH SCR	6	STAINLESS STEEL	COML	COML				FINISH TO MATCH FACE PLATE

NOTES:

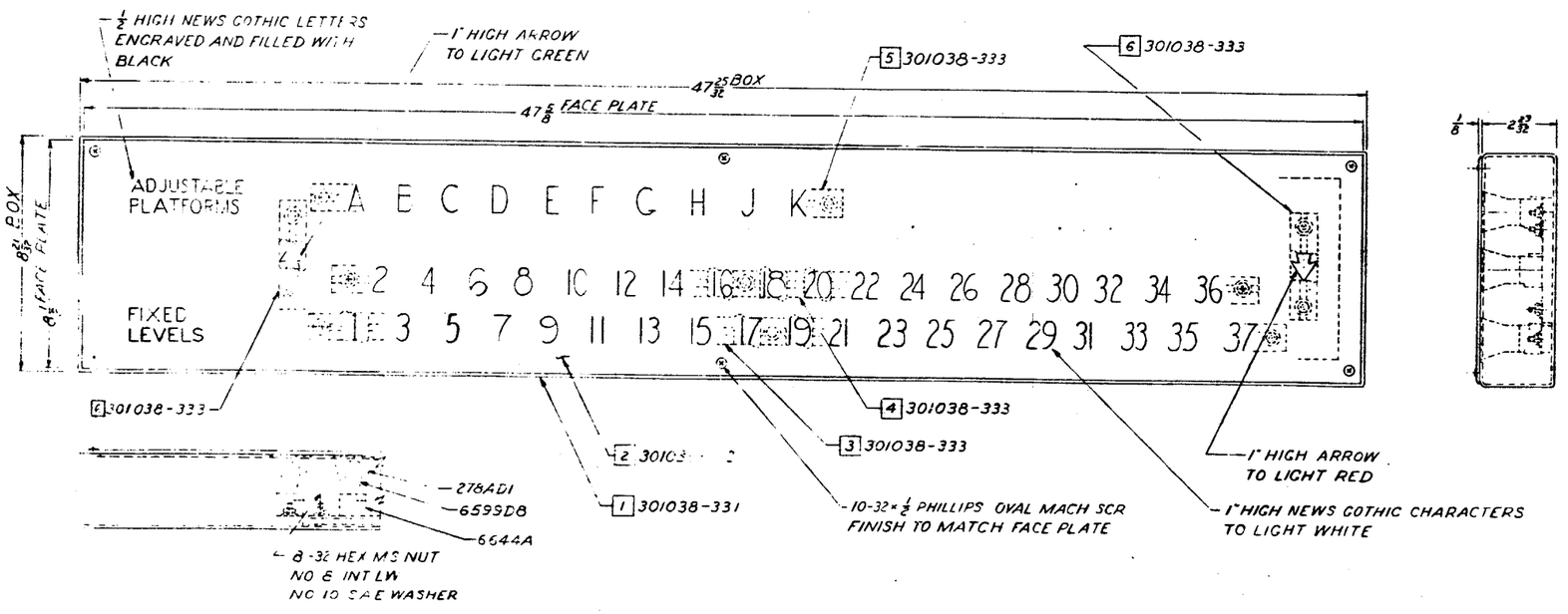
1- ALL HARDWARE ZINC PLATED PER 26DJ1 EXCEPT AS NOTED.

2- FOR FASTENING OF ELECTRICAL UNITS SEE DWG A26EG.

3- FOR ELECTRICAL CONNECTION OF LAMP UNITS SEE DWG 26EN ARR 1 & 2.

4- MOUNT BOX TO SUIT IN FIELD.

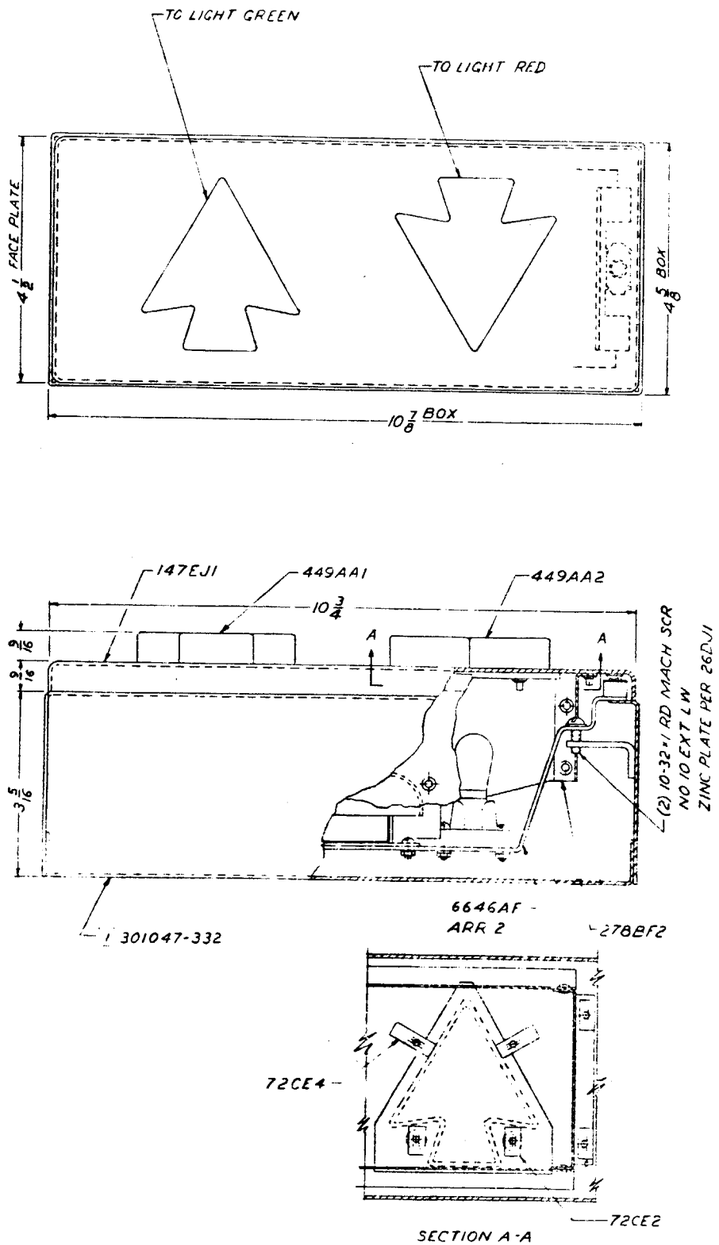
5- DRILL HOLES FOR ELECTRICAL CONDUIT TO SUIT IN FIELD.


1/2 HIGH NEWS GOTHIC LETTERS ENGRAVED AND FILLED WITH BLACK
1" HIGH ARROW TO LIGHT GREEN
47 25/32 BOX
47 5/8 FACE PLATE
5 301038-333
6 301038-333
ADJUSTABLE PLATFORMS
A B C D E F G H J K
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36
FIXED LEVELS
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37
8 1/2 BOX
8 1/8 FACE PLATE
1/8
2 25/32
4 301038-333
3 301038-333
2 301038-332
1 301038-331
1" HIGH ARROW TO LIGHT RED
10-32 × 1/2 PHILLIPS OVAL MACH SCR FINISH TO MATCH FACE PLATE
1" HIGH NEWS GOTHIC CHARACTERS TO LIGHT WHITE
278AD1
6599D8
6644A
8-32 HEX MS NUT NO 6 INT LW NO 10 SAE WASHER

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-330.

Figure 8-45. Hall Position Indicator



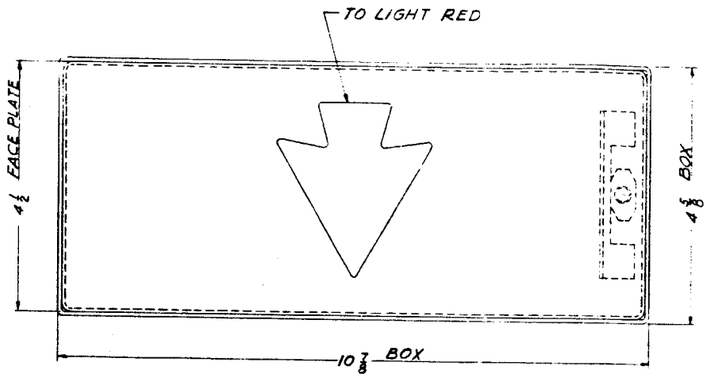
LIST OF MATERIAL —— QUANTITIES FOR ONE INTERMEDIATE HALL LANTERN FIXTURE

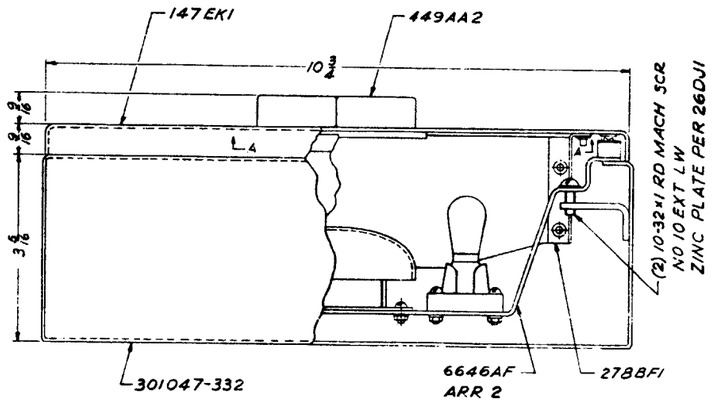
CONTRACTOR SERVICE PART NO	NAME	NO REQ'D		MATERIAL	MATL SPEC COML	MATL SPEC OTIS	MANUFACTURER'S NAME	MANUFACTURER'S SERVICE PART NO	UNIT OF MEAS	REMARKS
1 301047-332	BOX	1		STAINLESS STEEL	ASTM A167	NO 81				
147EJ1	FACE PLATE	1								
449AA1	GLASS, GREEN	1		MOULDED LUCITE	NO H 7500 COMP HM140					
449AA2	GLASS, RED	1								
278BF2	SHIELD	1		FIBRE		NO 1				
6646AF ARR NO 2	ASSEMBLY BASE PLATE CONSISTING OF:	—								
316BWE1	BRACKET	1			ASTM A415	NO 41A				
6599D9	LAMP	2								
467R1	SOCKET, CAND. LAMP	2		CERAMIC						
311B2	GONG	1								

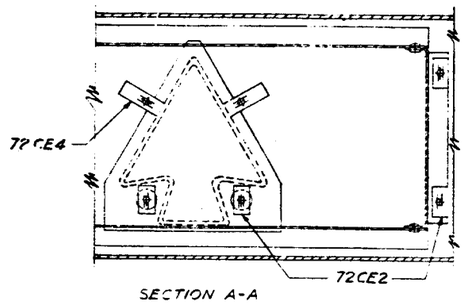
NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301047-330.

Figure 8-46. Hall Lanterns, Intermediate







SECTION A-A

LIST OF MATERIAL — QUANTITIES FOR ONE TERMINAL HALL LANTERN FIXTURE

CONTRACTOR SERVICE PART NO	NAME	NO REQD	MATERIAL	MATL SPEC COM'L	MATL SPEC OTIS	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO	UNIT WT LB	REMARKS
1 301047-332	BOX	1	STAINLESS	ASTM	NO 81				
147EK1	FACE PLATE	1	STEEL	A167					
449AA2	GLASS, RED	1	MOULDED LUCITE	NOH 7500 COMP HM 140					
2788F1	SHIELD	1	FIBRE		NO 1				
6646AF ARR NO 2	ASSEMBLY BASE PLATE CONSISTING OF:	—							
3168WE1	BRACKET	1		ASTM A415	NO 41A				
6599D9	LAMP	2							
467R1	SOCKET, CAND. LAMP	2	CERAMIC						
3118B3	GONG	1							

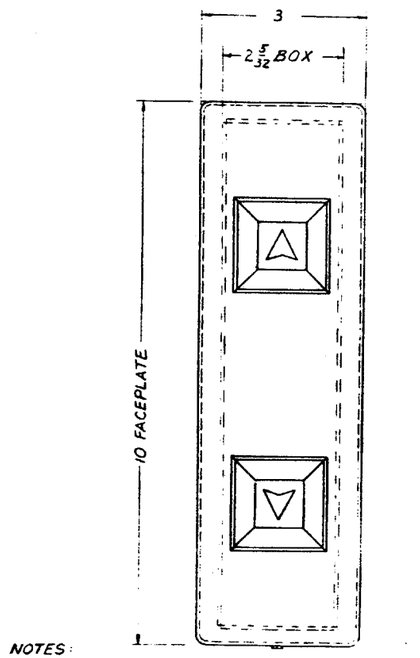
NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-312.

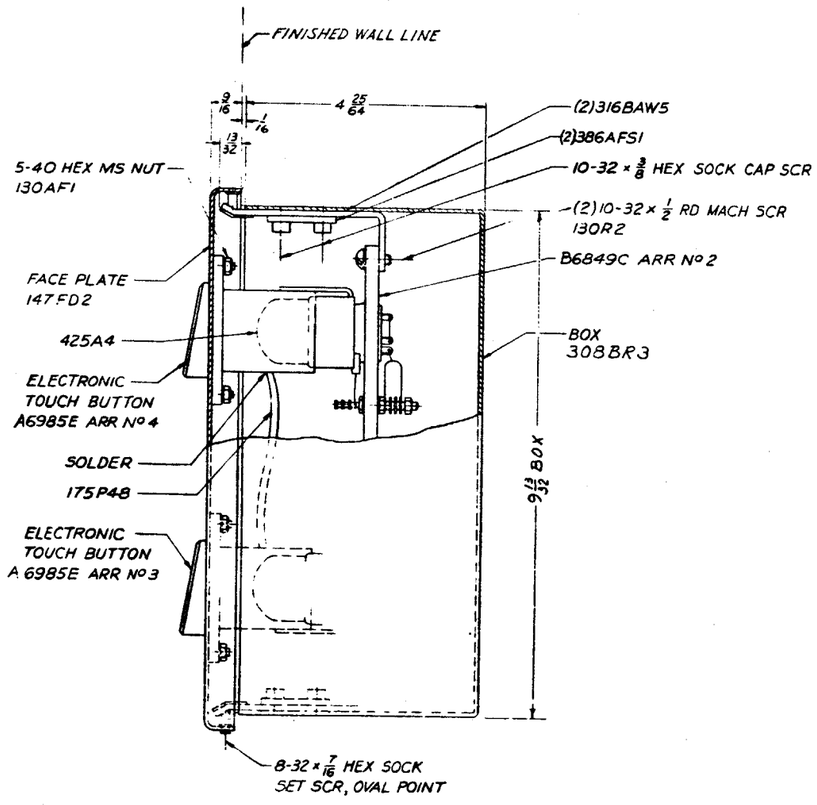
Figure 8-47. Hall Lanterns, Terminal

LIST OF MATERIAL — QUANTITIES FOR ONE ELECTRONIC HALL BUTTON

CONTRACTOR SERVICE PART NO	NAME	NO REQD	MATERIAL	MATL SPEC COML	MATL SPEC OTIS	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO	UNIT WT LB	REMARKS
308BR3	BOX	1	STEEL	ASTM A415	N°41A				
147FD2	FACE PLATE	1	STAINLESS STEEL	ASTM 167	N° 81				SATIN BRUSH FINISH
A6985E ARR N°3	ELECTRONIC TOUCH BUTTON ASSEMBLY	1							
A6985E ARR N°4		1							
386AFS1	LOCK PLATE	2	STEEL	ASTM A415	N° 41A				
316BAW5	BRACKET	2							
B6849C ARR N°2	ELECTRONIC TOUCH BUTTON PANEL ASSEM	1							
425A4	ELECTRONIC TUBE	2				RCA	2040		
	8-32 × 7/16 HEX SOCK SET SCR, OVAL POINT	1	STAINLESS STEEL	COML	COML				FINISH TO MATCH FACEPLATE
175P48	CONDUCTOR								



NOTES:
1. ALL HARDWARE ZINC PLATED PER 26D1, EXCEPT AS NOTED
2. JOIN LEAD CONNECTIONS WITH 1/16 DIA 60-40 KESTER N°44 RESIN CORE SOLDER, N° 58 CORE



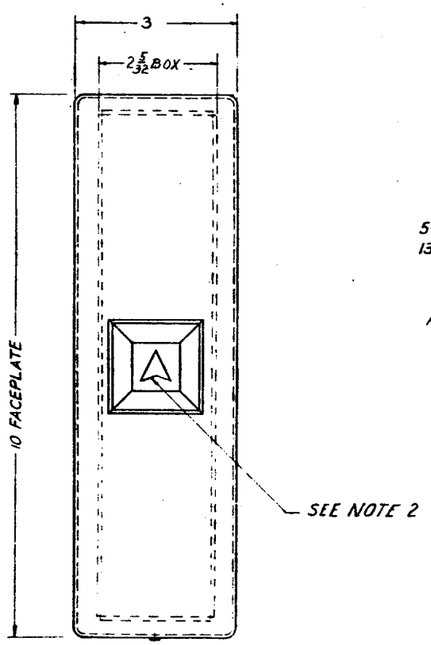
NOTE:

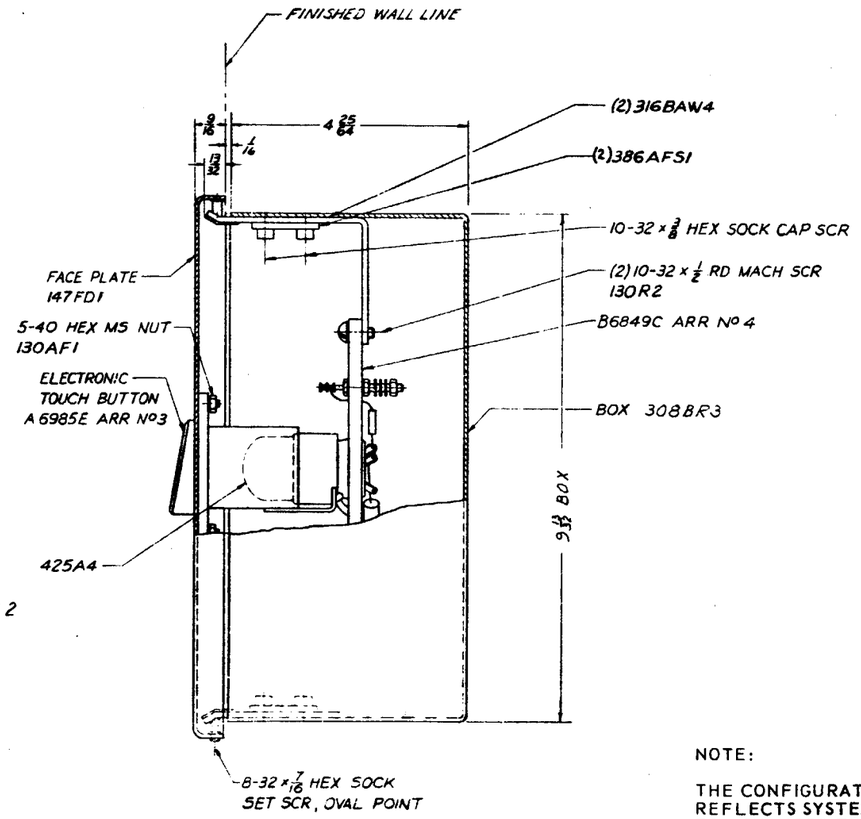
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-315.

Figure 8-48. Hall Button Fixture, Intermediate

LIST OF MATERIAL —— QUANTITIES FOR ONE ELECTRONIC HALL BUTTON

CONTRACTOR SERVICE PART NO	NAME	NO REQ'D	MATERIAL	MATL SPEC COM'L	MATL SPEC OTIS	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO	UNIT WT LB	REMARKS
308BR3	BOX	1	STEEL	ASTM A415	NO 41A				
147FD1	FACE PLATE	1	STAINLESS STEEL	ASTM A167	NO 31				SATIN BRUSH FINISH
A6985E ARR NO 3	ELECTRONIC TOUCH BUTTON ASSEMBLY	1							
386AFS1	LOCK PLATE	2	STEEL	ASTM A415	NO 41A				
316BAW4	BRACKET	2							
B6849C ARR NO 4	ELECTRONIC TOUCH BUTTON PANEL ASSEM	1							
425A4	ELECTRONIC TUBE	1				RCA	2040		
	8-32 x 7/16 HEX SOCK SET SCR, OVAL POINT	1	STAINLESS STEEL	COML	COML				FINISH TO MATCH FACEPLATE





NOTES:

1. ALL HARDWARE ZINC PLATED PER ZE0JI, EXCEPT AS NOTED
2. FOR LOWER TERMINAL FLOOR ARROW AS SHOWN, FOR UPPER TERMINAL ARROW OPPOSITE

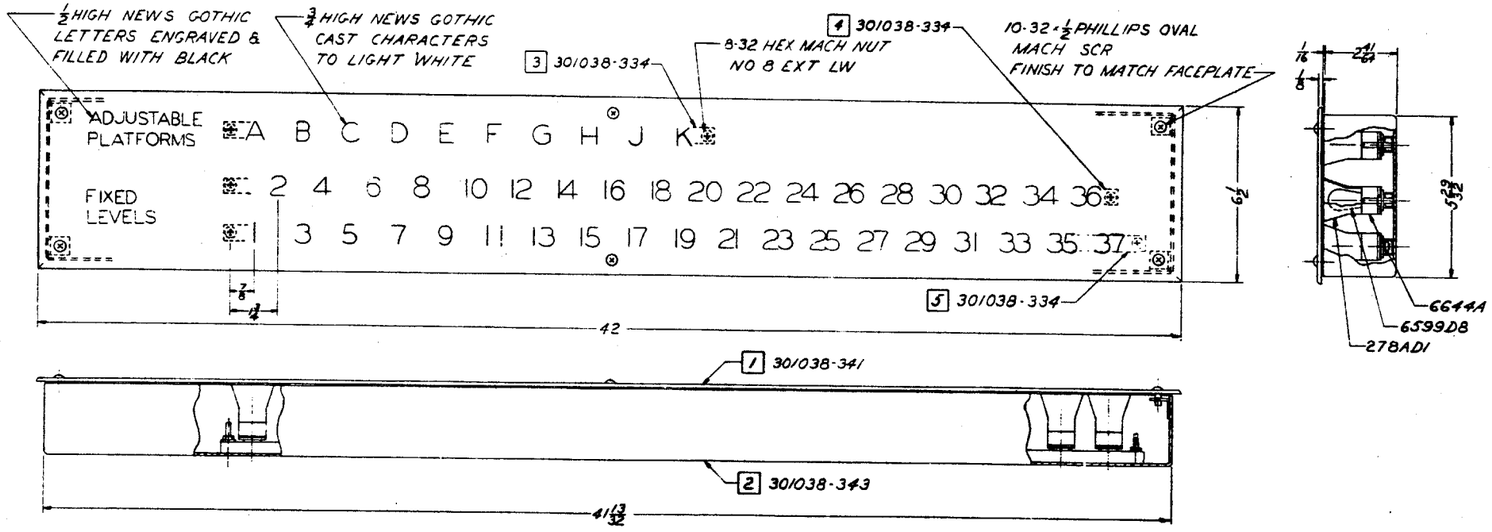
NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-314.

Figure 8-49. Hall Button Fixture, Terminal

LIST OF MATERIAL — QUANTITIES FOR ONE — CAR POSITION INDICATOR

CONTRACTOR SERVICE OR PART NO.	NAME	NO. REQ'D	MATERIAL	MATL SPEC COM'L	MATL SPEC OTIS	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG. NO.	UNIT WT LB	REMARKS
1 301038-341	FACEPLATE	1	STAINLESS STEEL	ASTM A167	NO 81				
2 301038-343	BOX	1	STEEL	ASTM A415	NO 41A				
3 301038-334	BASEPLATE	1	STEEL	QQ-S-00692 CL.C.	NO 16				
4 301038-334	BASEPLATE	1	STEEL	QQ-S-00692 CL.C.	NO 16				
5 301038-334	BASEPLATE	1	STEEL	QQ-S-00692 CL.C.	NO 16				
6644A	ASSEM LAMP UNIT	47							
6599D8	INCANDESCENT LAMP	47							
278AD1	LIGHT SHIELD	47	PHENOLIC		NO 1				
———	10-32 x 1/2 PHILLIPS OVAL MACH SCR	6	STAINLESS STEEL						FINISH TO MATCH FACEPLATE

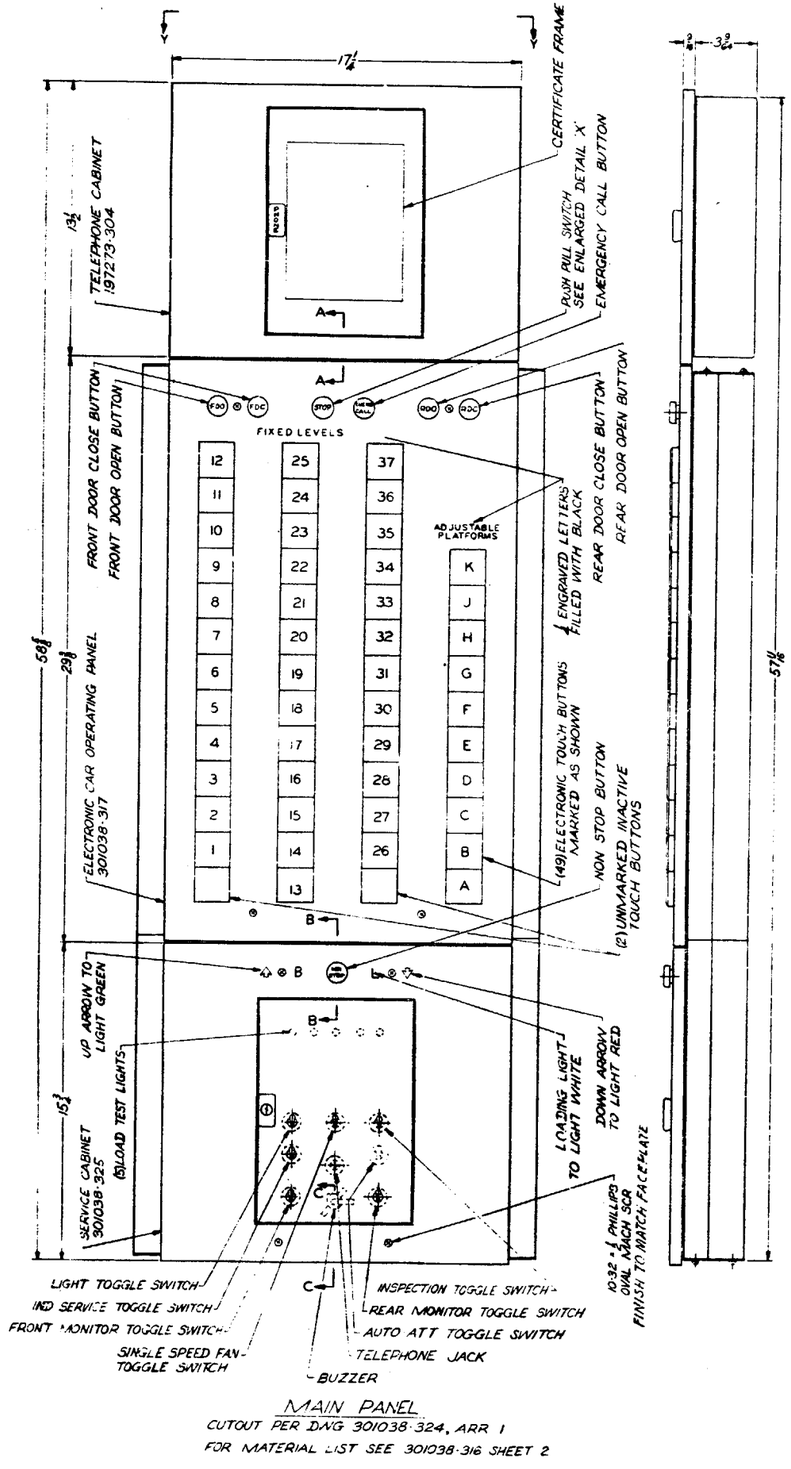

1/2 HIGH NEWS GOTHIC LETTERS ENGRAVED & FILLED WITH BLACK
3/4 HIGH NEWS GOTHIC CAST CHARACTERS TO LIGHT WHITE
3 301038-334
8-32 HEX MACH NUT NO 8 EXT LW
4 301038-334
10-32 x 1/2 PHILLIPS OVAL MACH SCR FINISH TO MATCH FACEPLATE
ADJUSTABLE PLATFORMS
A B C D E F G H J K
FIXED LEVELS
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37
6 1/2
5 301038-334
42
1 301038-341
2 301038-343
41 13/32
1/16
2 21/64
1/8
5 29/32
6644A
6599D8
278AD1

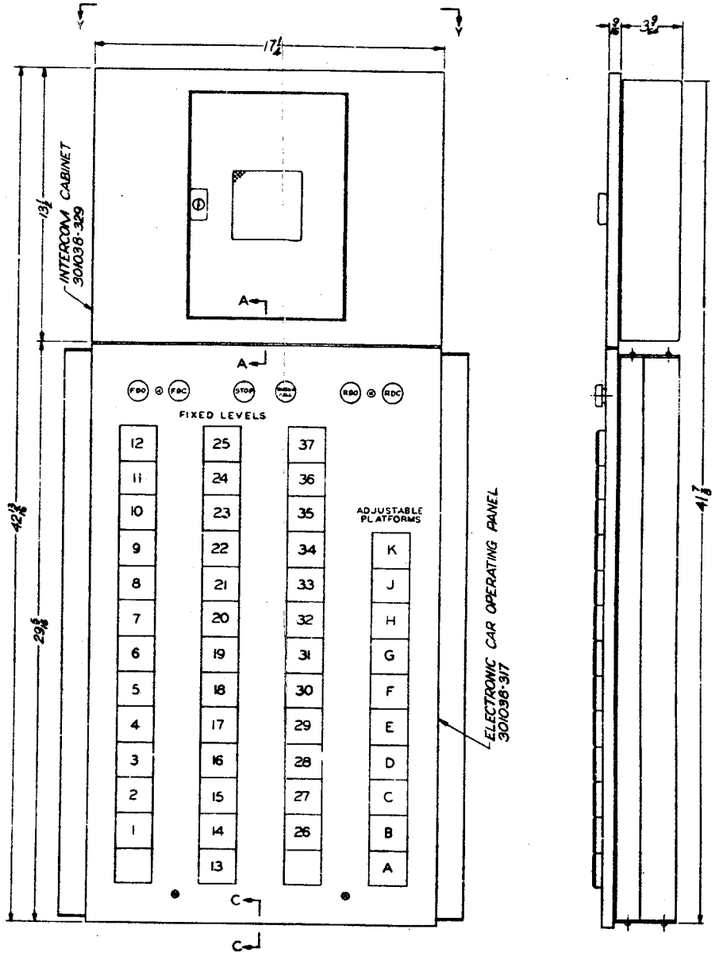
NOTES:
ALL HARDWARE CADMIUM PLATED PER QQ-P-416 EXCEPT AS NOTED
FOR FASTENING OF ELECTRICAL UNITS SEE DWG A26EG
FOR ELECTRICAL CONNECTION OF LAMP UNITS SEE DWG 26EN ARR 2
FOR CUTOUT SEE DWG 301038-342

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-340

Figure 8-50. Car Position Indicator


TELEPHONE CABINET 19273-304
FRONT DOOR CLOSE BUTTON
FRONT DOOR OPEN BUTTON
ELECTRONIC CAR OPERATING PANEL 301038-317
CERTIFICATE FRAME
PUSH PULL SWITCH SEE ENLARGED DETAIL 'X'
EMERGENCY CALL BUTTON
FIXED LEVELS
ADJUSTABLE PLATFORMS
ENGRAVED LETTERS FILLED WITH BLACK
REAR DOOR CLOSE BUTTON
REAR DOOR OPEN BUTTON
(49) ELECTRONIC TOUCH BUTTONS MARKED AS SHOWN
NON STOP BUTTON
(2) UNMARKED INACTIVE TOUCH BUTTONS
UP ARROW TO LIGHT GREEN
LOAD TEST LIGHTS
SERVICE CABINET 301038-325
LOADING LIGHT TO LIGHT WHITE
DOWN ARROW TO LIGHT RED
1032 #4 PHILLIPS OVAL MACH SCR FINISH TO MATCH FACEPLATE
LIGHT TOGGLE SWITCH
IND SERVICE TOGGLE SWITCH
FRONT MONITOR TOGGLE SWITCH
SINGLE SPEED FAN TOGGLE SWITCH
INSPECTION TOGGLE SWITCH
REAR MONITOR TOGGLE SWITCH
AUTO ATT TOGGLE SWITCH
TELEPHONE JACK
BUZZER
MAIN PANEL
CUTOUT PER DWG 301038-324, ARR 1
FOR MATERIAL LIST SEE 301038-316 SHEET 2


INTERCOM CABINET 301038-329
FIXED LEVELS
ADJUSTABLE PLATFORMS
ELECTRONIC CAR OPERATING PANEL 301038-317
ALL DATA NOT NOTED ON C.O.P SAME AS MAIN PANEL
AUX PANEL
CUTOUT PER DWG 301038-324, ARR 2
FOR MATERIAL LIST SEE 301038-316 SHEET 3

NOTE:
1. FOR SECTIONS A-A, B-B, C-C, DETAIL X AND VIEW Y-Y, SEE 301038-316 SHEET 3

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-316, SHEET 1.

Figure 8-51. Car Operating Panel (Sheet 1 of 4)

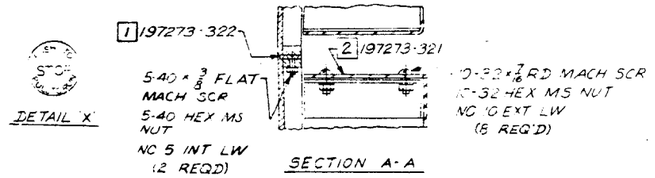
LIST OF MATERIAL —— QUANTITIES FOR ONE MAIN CAR OPERATING PANEL

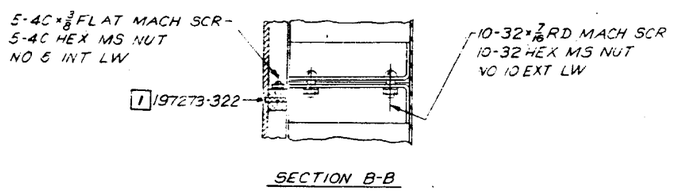
CONTRACTOR SERVICE PART NO	NAME	NO REQ'D	MATERIAL	MATL SPEC COML	MATL SPEC OTIS	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO	UNIT WT LB	REMARKS
301038-317	CAR OPERATING PANEL ASSEMBLY CONSISTING OF:	—		—	—				
301038-319	FACE PLATE ASSEMBLY CONSISTING OF:	—		—	—				
5 301038-320	FACE PLATE	1	STAINLESS STEEL	ASTM A167	NO 8I				
197273-318	BRACE	1	STEEL	—	—				
315FX3		2							
A6985E-ARR1	ELECTRONIC TOUCH BUTTON ASSEMBLY	49		—	—				MARKED PER ORDER
6985T	POTENTIAL CONTACT ASSEMBLY	1		—	—				
~~323AD2~~	BUTTON	~~4~~		—	—				
~~4-323AD1~~		~~1~~							
6 301038-322	BOX	1	STEEL	ASTM A415	NO 41A				
3010038-318	BASE PLATE CAR OPERATING PANEL ASSEMBLY CONSISTING OF:	—		—	—				
3 301038-321	BRACKET	1	STEEL	ASTM A415	NO 41A				
4 301038-321		1							
1 301038-323		1							
1 197273-315		1		AISIM1020	NO 2				
1 197273-320	PLATE	1		ASTM A415	NO 41A				
2 197273-320		1							
3 197273-320	BAR	3							
1 197039-318	RESISTOR UNIT ASSEMBLY	1		—	—				
1-6849H	PANEL ELECTRONIC TOUCH BUTTON ASSEMBLY	47		—	—				
425A2	ELECTRONIC TUBE	47		—	—				
~~7035A4~~	PUSH BUTTON UNIT	~~5~~		—	—				
~~7035A2~~		~~1~~							
7014A1	PUSH PULL SWITCH	1		—	—				
232Y36	RESISTOR	1		—	—				
316RJ2	RESISTOR BRACKET	1	STEEL	ASTM A415	NO 41A				
301038-325	SERVICE CABINET ASSEMBLY CONSISTING OF:	—		—	—				
10 301038-328	BOX	1	STEEL	ASTM A415	NO 41A				
137E44	TUBE	2	POLYVINYL	—	—				
7035A1	PUSH BUTTON UNIT	1		—	—				
6644A	LAMP RECEPTACLE	2		—	—				
278AD2	LIGHT SHIELD	2	PHENOLIC	—	NO 1				
6599D8	INCANDESCANT LAMP	2		—	—				
B147FE1	FACE PLATE	1	STAINLESS STEEL	ASTM A167	NO 8I				
316CAK1	BRACKET	1	STEEL	ASTM A415	NO 41A				
A316BXW1		1							
301038-326	FRAME ASSEMBLY CONSISTING OF	—		—	—				
9 301038-327	FRAME	1	STAINLESS STEEL	ASTM A167	NO 8I				
A406P1	DOOR	1							
462DH1	SPACER	1	BRASS	ASTM B135 ALLOY E	NO 5				
299WM2	BAR	2	STEEL	ASTM A108	NO 10				
283BC2	FORMED ANGLE	1		QQ-S-00692 CL C	NO 16				
316BTV1	HINGED BRACKET	1		ASTM A415	NO 41A				
323BD2	BUTTON	1		—	—				
431G1	DOOR LOCK	1		—	—	EAGLE LOCK CO	S694		FINISH TO MATCH DOOR & HANDLE
391AK1	HINGE PLATE	1	BRONZE	ASTM B415 ALLOY 4A	NO 2				
391AK2		1							
388BA2	HANDLE	1	MONEL METAL	—	—				FINISH TO MATCH DOOR
B6986C	BASE PLATE ASSEMBLY CONSISTING OF	—		—	—				
B105CN1	BASE PLATE	1	STEEL	ASTM A415	NO 41A				
299WP1	BAR	1		ASTM A108	NO 10				
6644A	LAMP RECEPTACLE	5		—	—				
278AM1	LIGHT SHIELD	5	PHENOLIC	—	NO 1				
424A3	NEON LAMP	5		—	—				
6599A8	TOGGLE SWITCH	7		—	—				
6599F2	TELEPHONE JACK ASSEMBLY	1		—	—				
6219D2	BUZZER	1		—	—				
—	0.32 x 1/2 PHILLIPS OVAL MACH SCR	6	STAINLESS STEEL	COML	COML				FINISH TO MATCH FACE PLATE
1 197273-321	COVER	1	STEEL	ASTM A415	NO 41A				
2 197273-321		1							
1 197273-322	PLATE	2	STAINLESS STEEL	ASTM A167	NO 8I				

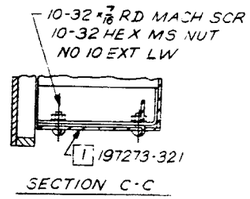
NOTE:

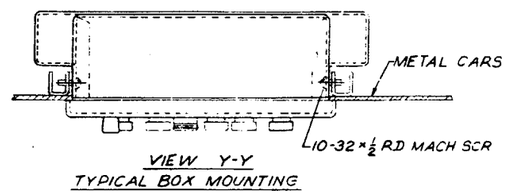
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-316, SHEET 2.

Figure 8-51. Car Operating Panel (Sheet 2 of 4)









LIST OF MATERIAL — QUANTITIES FOR ONE AUX CAR OPERATING PANEL

CONTRACTOR SERVICE PART NO	NAME	NO REQD	MATERIAL	MATL SPEC COML	MATL SPEC OTIS	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR STK NO	UNIT WT LB	REMARKS
301038-317	CAR OPERATING PANEL ASSEMBLY CONSISTING OF:	–	—	—	—				
301038-319	FACE PLATE ASSEMBLY	–	—	—	—				
5 301038-320	FACE PLATE	1	STAINLESS STEEL	ASTM A167	NO 81				
197273-318	BRACE	1	STEEL	—	—				
315FX3		2							
A6985E ARR 1	ELECTRONIC TOUCH BUTTON ASSEMBLY	49		—	—				MARKED PER ORDER
6985T	POTENTIAL CONTACT ASSEMBLY	1		—	—				
323BD2	BUTTON	4		—	—				
4-323BD1		1							
6 301038-322	BOX	1	STEEL	ASTM A415	NO 41A				
301038-318	BASE PLATE CAR OPERATING PANEL ASSEMBLY	–		—	—				
3 301038-321	BRACKET	1	STEEL	ASTM A415	NO 41A				
4 301038-321		1							
1 301038-323		1							
1 197273-315		1			NO 2				
1 197273-320	PLATE	1		ASTM A415	NO 41A				
2 197273-320		1							
3 197273-320	BAR	3							
1 197039-318	RESISTOR UNIT ASSEMBLY	1		—	—				
1-6849H	PANEL ELECTRONIC TOUCH BUTTON ASSEMBLY	47		—	—				
425A2	ELECTRONIC TUBE	47		—	—				
7035A4	PUSH BUTTON UNIT	5		—	—				
7035A2		1							
7014A1	PUSH PULL SWITCH	1		—	—				
232Y36	RESISTOR	1		—	—				
316RJ2	RESISTOR BRACKET	1	STEEL	ASTM A415	NO 41A				
301038-329	INTERCOM CABINET ASSEMBLY CONSISTING OF:	–	—	—	—				
A406R2	DOOR	1	STAINLESS STEEL	ASTM A167	NO 81				
1 197273-305	FRAME	1	STEEL	ASTM A415	NO 41A				
A313AH2	BOX	1	STEEL	ASTM A108	NO 16				
299WM2	BAR	2	STEEL	—	—				
124CJ3	SPECIAL ROUND ALLEN HEAD SCREW	14	—	—	—				FINISH TO MATCH DOOR
388BA2	HANDLE	1	MONEL METAL	—	—				
283BC2	FORMED ANGLE	1	STEEL	QQ-S-00698 CL-C	NO 16				
316BTV1	HINGED BRACKET	1	STEEL	ASTM A415	NO 41A				
391AK1	HINGE PLATE	1	BRONZE	ASTM B15 ALLOY 4A	NO 2				
391AK2		1							
49AJ1	GRILLE	1	STAINLESS STEEL	ASTM A167	NO 81				
431G1	DOOR LOCK	1		—	—	EAGLE LOCK CO	S694		FINISH TO MATCH DOOR & HANDLE
462DH1	SPACER	1	BRASS	ASTM B16 ALLOY E	NO 5				
433EF1	SPEAKER PANEL	1		—	—	EXECUTONE INC	MODEL C-195		FURNISHED BY ZONE
—	10-32 × 1/2 PHILLIPS OVAL MACH SCR	4	STAINLESS STEEL	COML	COML				FINISH TO MATCH FACE PLATE
1 197273-321	COVER	1	STEEL	ASTM A415	NO 41A				
2 197273-321		1							
1 197273-322	PLATE	1	STAINLESS STEEL	ASTM A167	NO 81				

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-316, SHEET 3.

Figure 8-51. Car Operating Panel (Sheet 3 of 4)

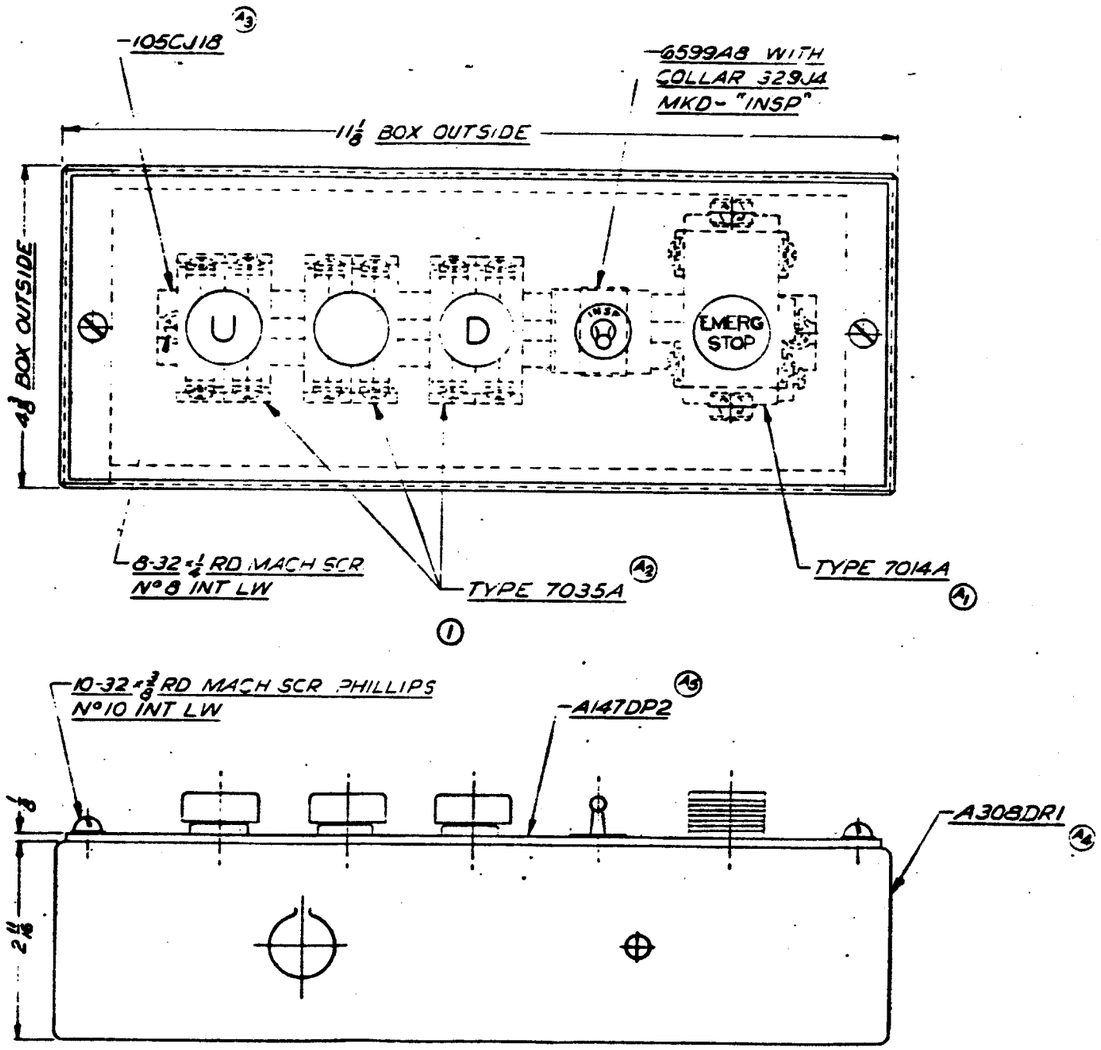
LIST OF MATERIAL —— QUANTITIES FOR ONE *MAIN CAR OPERATING PANEL*

CONTRACTOR SERVICE PART NO	NAME	NO. REQ'D		MATERIAL	MATL. SPEC. GOVT.	MATL. SPEC. COM'L.	MATL. SPEC. OTIS			MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG NO.	UNIT WT. LB	REMARKS
197273-304	TELEPHONE CABINET ASSEMBLY CONSISTING OF:	—											
A406P2	DOOR	1		STAINLESS STEEL		ASTM A167	NO 81						
1 197273-305	FRAME	1		STAINLESS STEEL		ASTM A167	NO 81						
A313AH1	BOX	1		STEEL		ASTM A415	NO 41A						
299WM2	BAR	2		STEEL		ASTM A108	NO 10						
124CJ3	SPECIAL ROUND ALLEN HEAD SCREW	10		—		—	—						FINISH TO MATCH DOOR
388BA4	HANDLE	1		MONEL METAL		—	—						
283BC1	FORMED ANGLE	1		STEEL		QQ-S-00692 CL-C	NO 16						
316BTV1	HINGED BRACKET	1		STEEL		ASTM A415	NO 41A						
391AK1	HINGED PLATE	1		BRONZE		ASTM B415 ALLOY 4A	NO 2						
391AK2	HINGED PLATE	1		BRONZE		ASTM B415 ALLOY 4A	NO 2						

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 301038-316, SHEET 4.

Figure 8-51. Car Operating Panel (Sheet 4 of 4)



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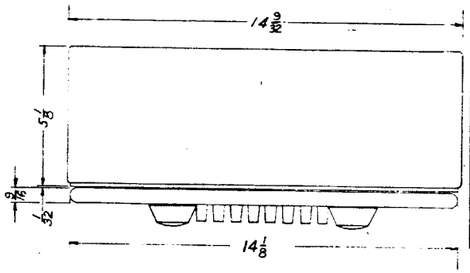
NOTES:

1. TYPICAL FASTENING OF ELECTRICAL PARTS PER A26EG (A4)
2. CADMIUM PLATE ALL HARDWARE PER 26DJ4

NOTE:

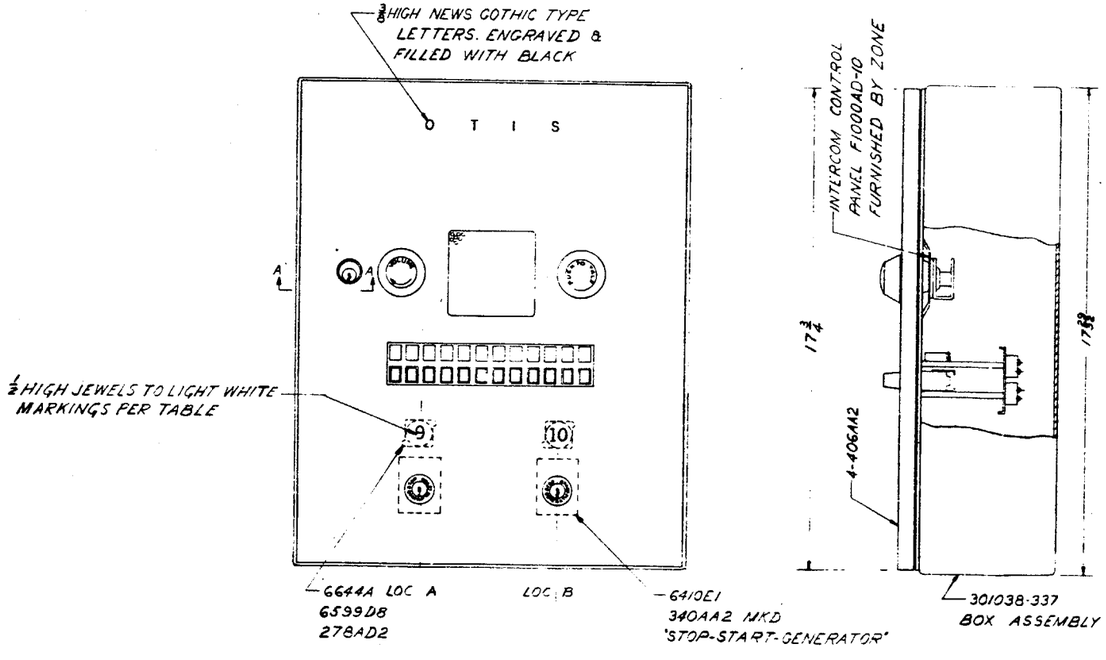
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING A7003C

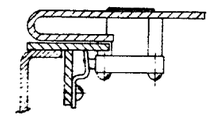
Figure 8-52. Car Top Inspection Control Box



LIST OF MATERIAL —— QUANTITIES FOR ONE — LOBBY CONTROL PANEL

CONTRACTOR SERVICE OR PART NO.	NAME	NO REQ'D	MATERIAL	MATL SPEC COML	MATL SPEC OTIS	MANUFACTURER NAME	MANUFACTURER SERVICE PART OR DWG. NO.	UNIT WT LB	REMARKS
4-406AA2	DOOR	1	STAINLESS STEEL	ASTM A167	NO 81				
301038-337	BOX ASSEMBLY CONSISTING OF:-	—							
[1] 301047-365	FRAME, PANEL	1	STAINLESS STEEL	ASTM A167	NO 81				
[2] 301038-338	BOX	1							
[3] 301038-339	FORMED, ANGLE	2	STEEL	ASTM A415	NO 41A				
283DP1	FORMED, ANGLE	4	STEEL	ASTM A415	NO 41A				
283DR1	FORMED, ANGLE	4	STEEL	ASTM A415	NO 41A				
[4] 301047-378	BRACKET	2	STEEL	ASTM A415	NO 41A				
[5] 301047-378	BRACKET	1	STEEL	ASTM A415	NO 41A				
[6] 301047-378	BRACKET	1	STEEL	ASTM A415	NO 41A				
391AG1	HINGE PLATE	2	STEEL	AISI C1045					
[4] 301038-338	BASE PLATE	2	STEEL	QQ-S-00692 CL C	NO 16				
——	INTERCOM PANEL	1				EXECUTONE INC.	MODEL FIOOOAD-40		FURNISHED BY ZONE
6410E1	KEY SWITCH	2							
6644A	ASSEM LAMP UNIT	2							
6599D8	INCANDESCENT LAMP	2							
278AD2	LIGHT SHIELD	2	PHENOLIC		NO 1				
41W1	KEEPER	1	STAINLESS STEEL	ASTM A167	NO 81				





SECTION A-A

ARRGT	CONTRACT	MARKINGS LOC A	MARKINGS LOC B
1	301038 FUTURE	3	4
2	301039 FUTURE	5	6
3	301040 301041	10	9
4	301042 301043	12	11
5	301044 301045	14	13
6	301046 FUTURE	16	15

NOTES

FOR TYPICAL FASTENING OF ELECTRICAL UNITS SEE DWG A26EG
FOR TYPICAL ELECTRICAL CONNECTION OF LAMP UNITS SEE DWG 26EN APP 2

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING **301038-366.**

Figure 8-53. Lobby Control Panel

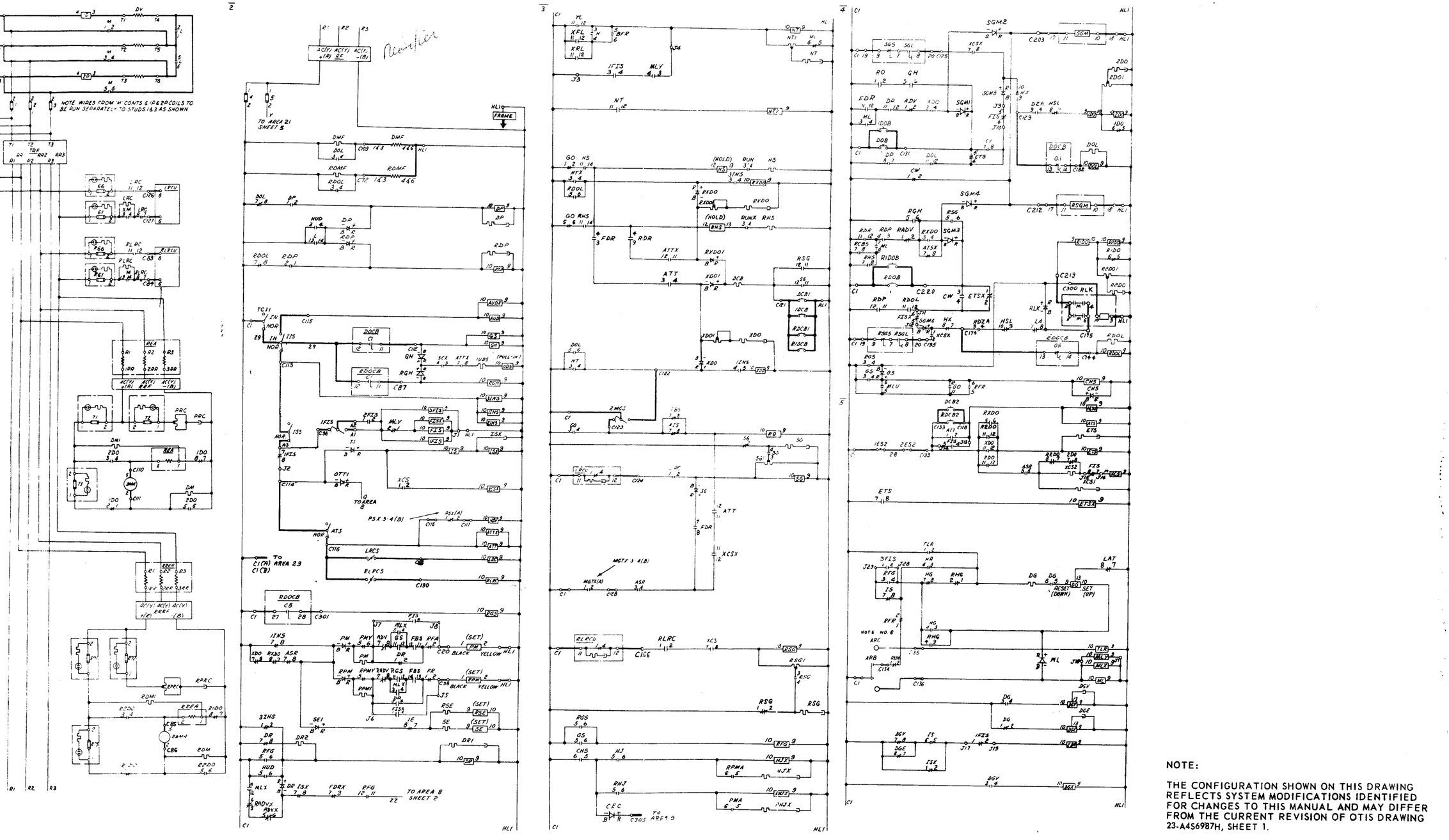

NOTE WIRES FROM 'M' CONTS & IF&2D COILS TO BE RUN SEPARATELY TO STUDS 1&3 AS SHOWN
SEE AREA 9 SHEET 2
TO AREA 21 SHEET 5
FRAME
TO AREA 8 SHEET 2
TO C1(A) AREA 23 C1(B)
TO AREA 9
NOTE:
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 23-A4S6987H, SHEET 1.

Figure 8-54. System Schematic Diagram (Sheet 1 of 8)

Revised 1 March 1968

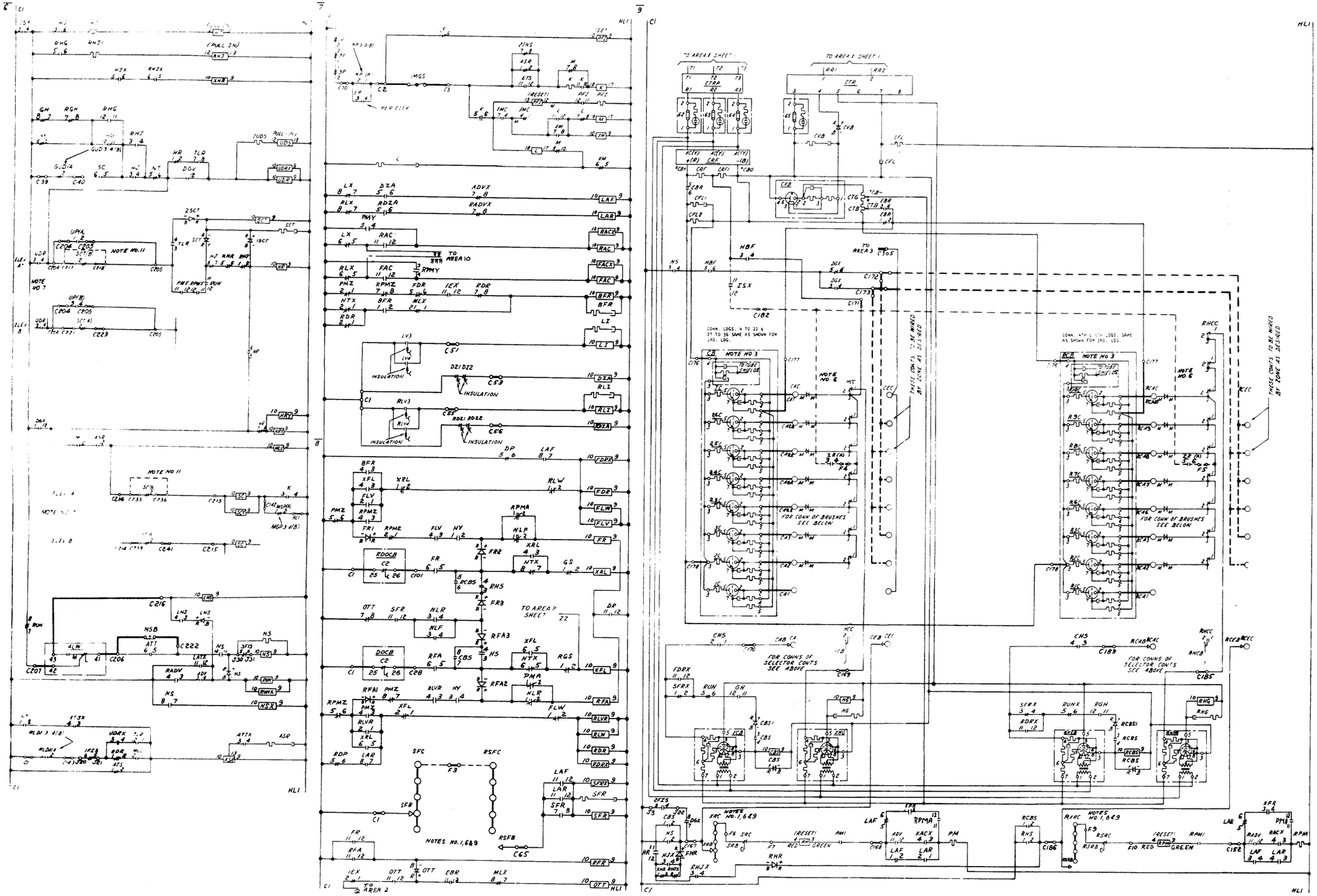
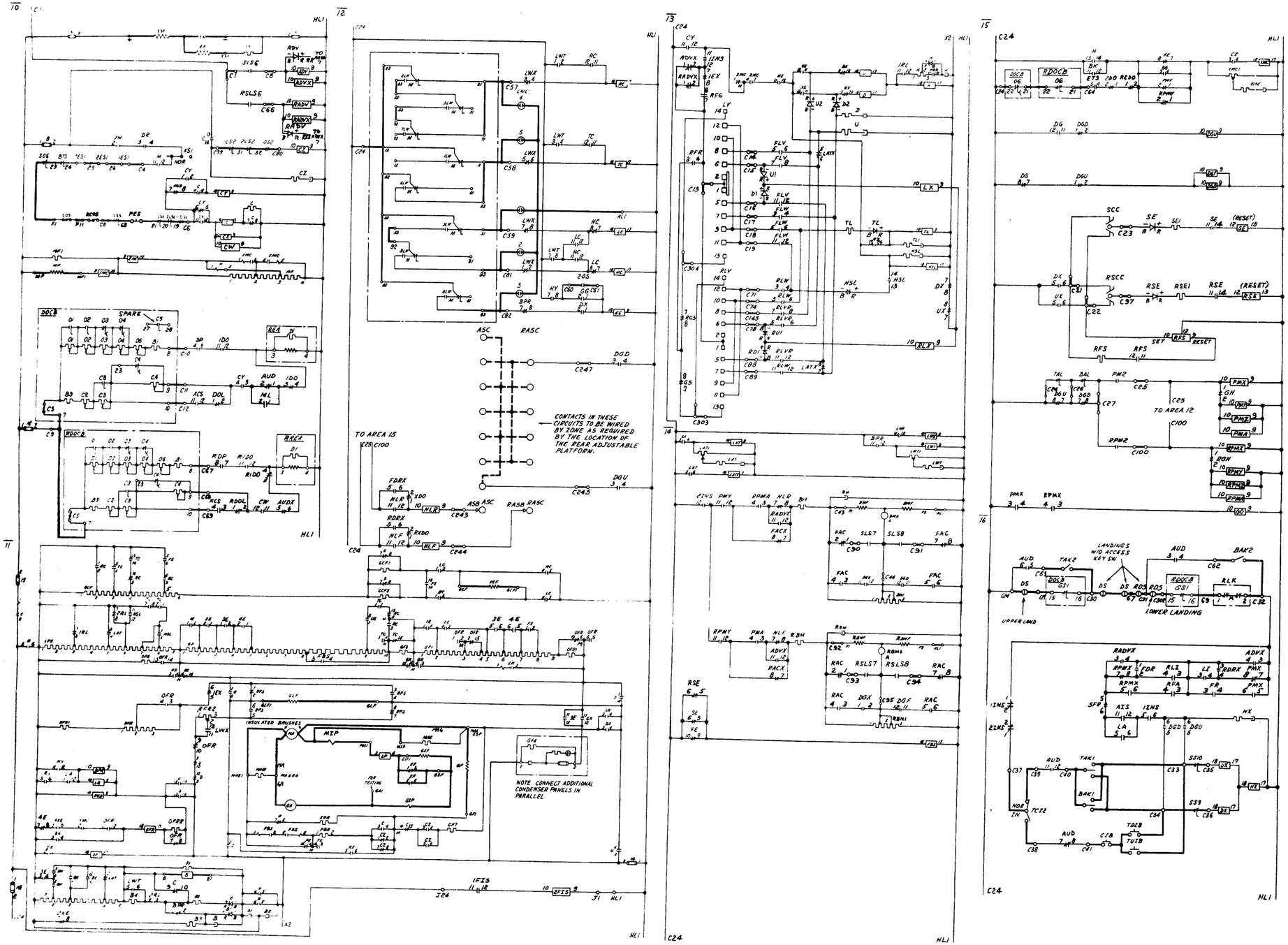

NOTE:
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 23-A4S6987H, SHEET 2.

Figure 8-54. System Schematic Diagram (Sheet 2 of 8)

Revised 1 March 1968


CONTACTS IN THESE CIRCUITS TO BE WIRED BY ZONE AS REQUIRED BY THE LOCATION OF THE REAR ADJUSTABLE PLATFORM.
NOTE CONNECT ADDITIONAL CONDENSER PANELS IN PARALLEL
INSULATED BRUSHES
TO AREA 15
TO AREA 12
LANDINGS W/O ACCESS KEY SW
UPPER LAND
LOWER LANDING

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 23-A4S6987H, SHEET 3.

Figure 8-54. System Schematic Diagram (Sheet 3 of 8)

Revised 1 March 1968

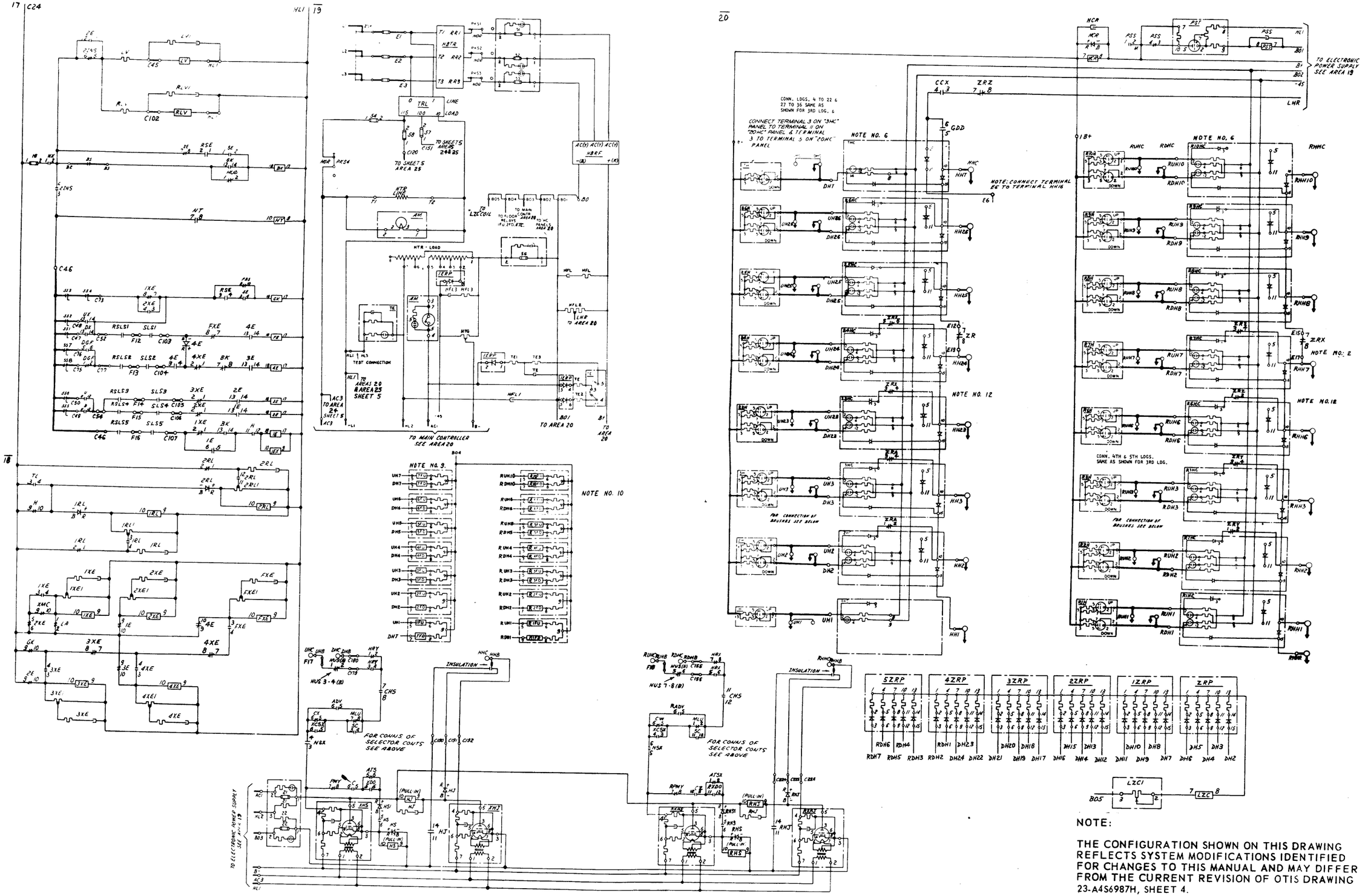

NOTE NO. 6
NOTE NO. 9.
NOTE NO. 10
NOTE NO. 12
NOTE NO. 2
NOTE: CONNECT TERMINAL EE TO TERMINAL HH16
CONN. LDGS. 4 TO 22 & 27 TO 36 SAME AS SHOWN FOR 3RD LDG. G
CONNECT TERMINAL 3 ON "3HC" PANEL TO TERMINAL U ON "2HC" PANEL & TERMINAL 3 TO TERMINAL S ON "2DHC" PANEL
CONN. 4TH & 5TH LDGS. SAME AS SHOWN FOR 3RD LDG.
FOR CONNECTION OF BRUSHES SEE BELOW
TO ELECTRONIC POWER SUPPLY SEE AREA 19
TO MAIN CONTROLLER SEE AREA 20
TO AREA 20
TO AREAS 20 & AREA 25 SHEET 5
TEST CONNECTION
FOR CONNS OF SELECTOR CONTS SEE ABOVE
INSULATION
5ZRP
4ZRP
3ZRP
2ZRP
1ZRP
ZRP
NOTE:
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 23-A4S6987H, SHEET 4.

Figure 8-54. System Schematic Diagram (Sheet 4 of 8)

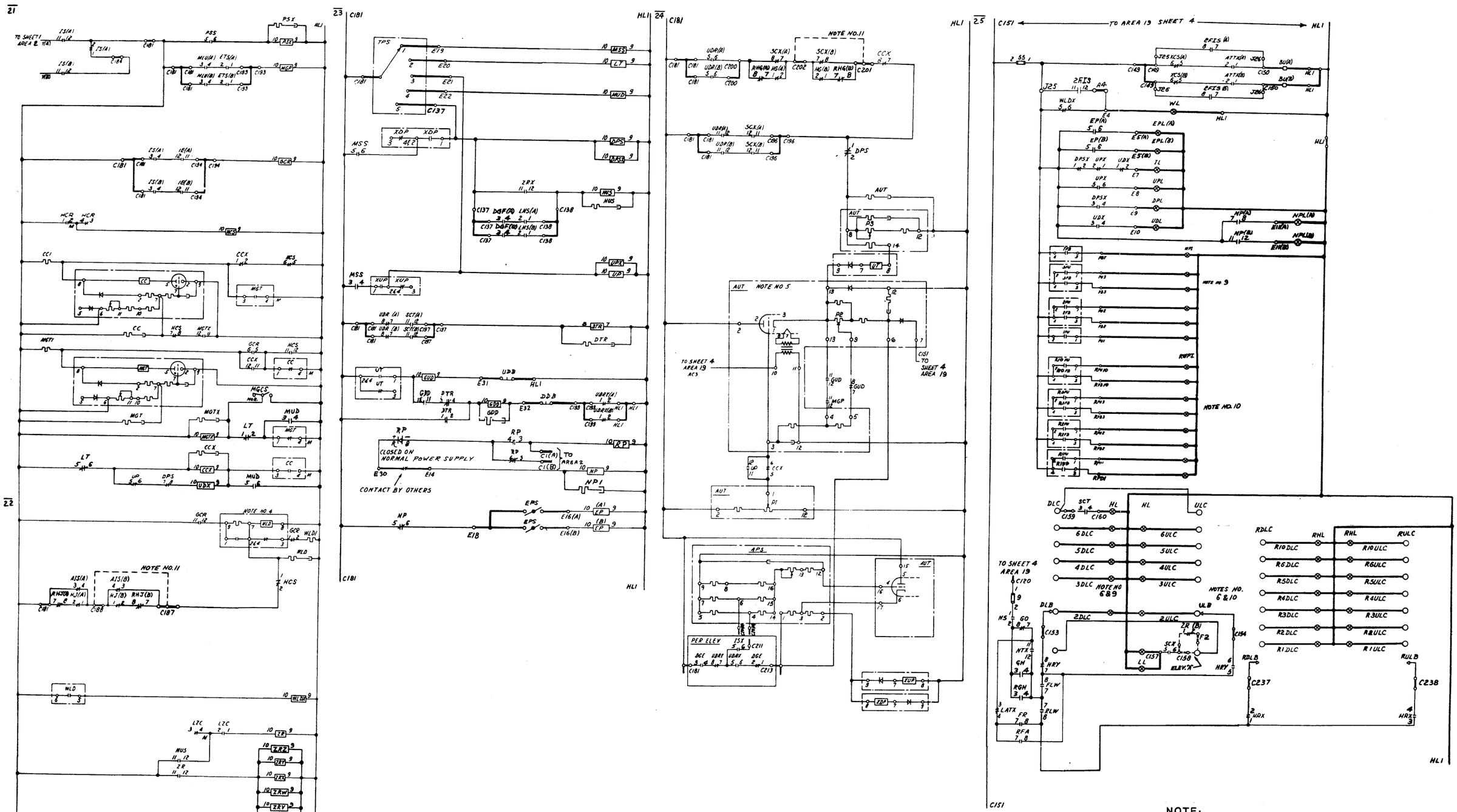
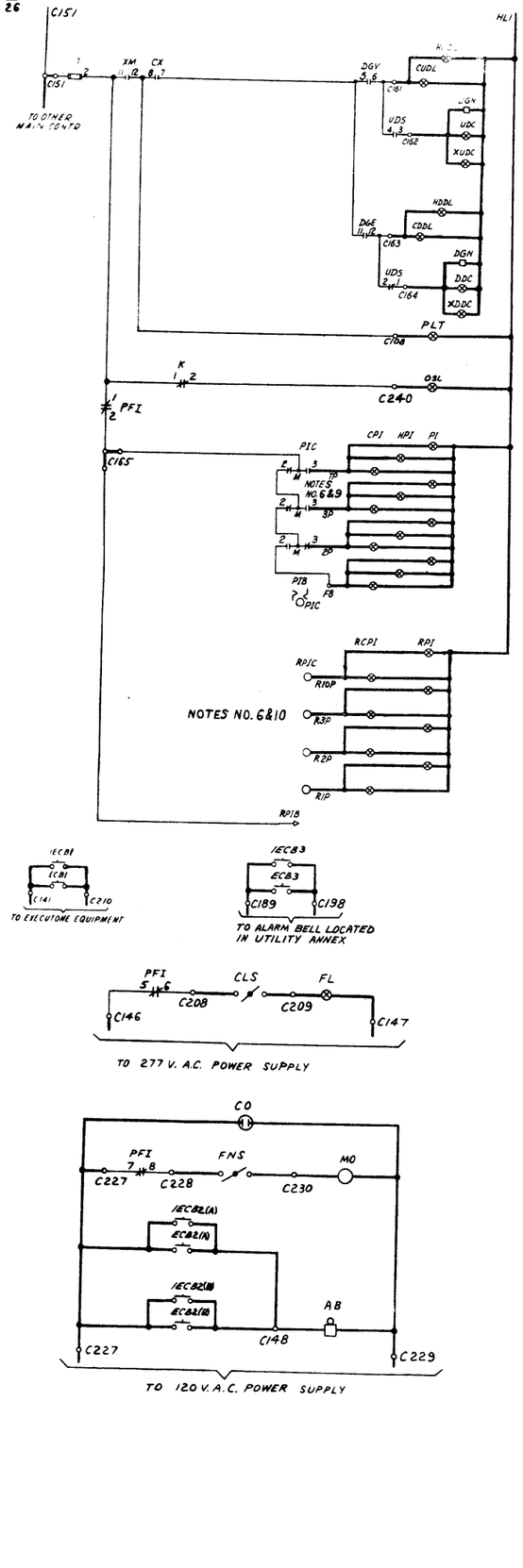
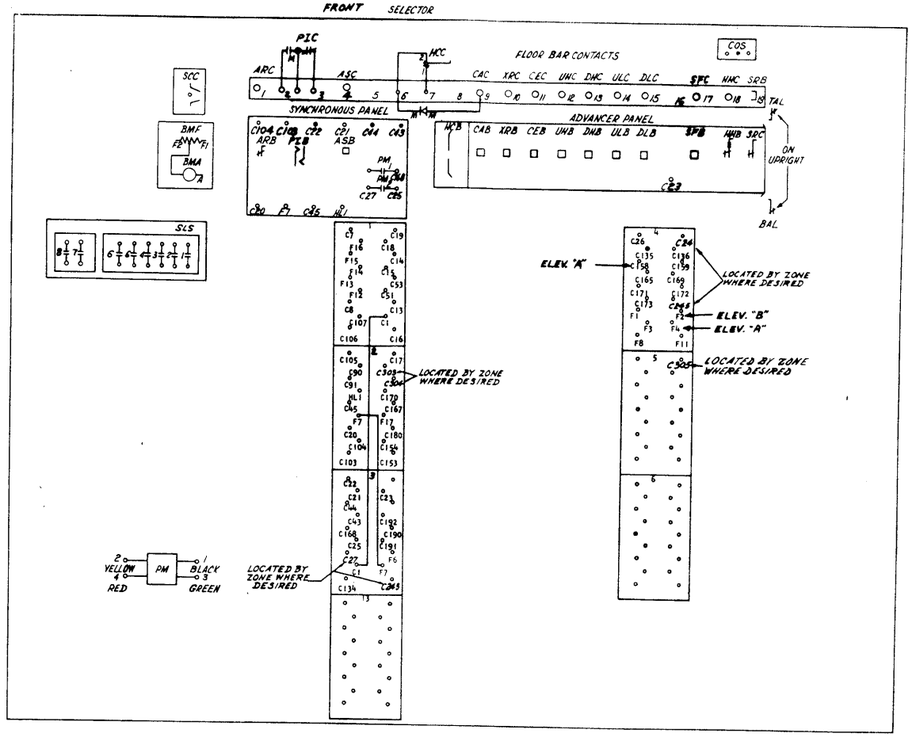

NOTE:
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 23-A4S6987H, SHEET 5.

Figure 8-54. System Schematic Diagram (Sheet 5 of 8)





NAMES OF FRONT SELECTOR APPARATUS	SYMBOL	LOCATION	VAR ITEM
AUTOMATIC REVERSAL BRUSH	ARB	5	
AUTOMATIC REVERSAL CONTS	ARC	5	
BOTTOM ADVANCER LIMIT	BAL	15	
BRUSH MOTOR ARMATURE	BMA	14	
BRUSH MOTOR FIELD	BMF	14	
CAR STOP BRUSH	CAB	6	
CAR STOP CONTACTS	CAC	9	
CAR EMERGENCY STOP BRUSH	CEB	9	
CAR EMERGENCY STOP CONTS	CEC	9	
CUTOUT SWITCH	COS	10	
DOWN HALL STOP BRUSH	DHB	20	
DOWN HALL STOP CONTACTS	DHC	20	
DOWN HALL LANTERN BRUSH	DLB	25	
DOWN HALL LANTERN CONTS	DLC	25	
DOOR ZONE CONTACTS	DZ	7	
HIGH CAR CALL RETURN BRUSH	HCB	9	
HIGH CAR CALL RETURN CONTS	HCC	9	
HIGH HALL CALL RETURN BRUSH	HHB	20	
HIGH HALL CALL RETURN CONTACTS	HHC	20	
LEVELING SWITCH	LV	7,13,17	
POSITION INDICATOR BRUSH	PIB	26	
POSITION INDICATOR CONTS	PIC	26	
PAWL MAGNET	PM	2,9,15	
STOP CONTROL SWITCH	SCC	15	
SAME FLOOR BRUSH	SFB	8	
SAME FLOOR CONTACTS	SFC	8	
SELECTOR STOPPING SW	SLS	10,14,17	
SEL ROCKING CONT BRUSH	SRB	9	
SELECTOR ROCKING CONTACT	SRC	9	
TOP ADVANCER LIMIT	TAL	16	
UP HALL STOP BRUSH	UHB	20	
UP HALL STOP CONTACTS	UHC	20	
UP HALL LANTERN BRUSH	ULB	25	
UP HALL LANTERN CONTACTS	ULC	25	
AUX ROCKING CONT BRUSH	XRB	9	
AUX ROCKING CONTACT	XRC	9	
ADVANCER SPEED BRUSH	ASB	12	
ADVANCER SPEED CONTACTS	ASC	12	

NAMES OF REAR SELECTOR APPARATUS	SYMBOL	LOCATION	VAR ITEM
REAR BRUSH MOTOR ARM	RBMA	14	
REAR BRUSH MOTOR FIELD	RBMF	14	
REAR CAR STOP BRUSH	RCAB	9	
REAR CAR STOP CONTACTS	RCAC	9	
REAR CAR EMERG STOP BRUSH	RCEB	9	
REAR CAR EMERG STOP CONTS	RCEC	9	
REAR CUTOUT SWITCH	RCOS	10	
REAR DOWN HALL STOP BRUSH	RDHB	20	
REAR DOWN HALL STOP CONTS	RDHC	20	
REAR DN HALL LANT BRUSH	RDLB	25	
REAR DN HALL LANT CONTS	RDLC	25	
REAR DOOR ZONE CONTACTS	RDZ	7	
REAR HIGH CAR CALL RETURN BRUSH	RHCB	9	
REAR HIGH CAR CALL RETURN CONTACTS	RHCC	9	
REAR HIGH HALL CALL RETURN BRUSH	RHHB	20	
REAR HIGH HALL CALL RETURN CONTACTS	RHHC	20	
REAR LEVELING SWITCH	RLV	7,13,17	
REAR POSITION INDICATOR BRUSH	RPIB	26	
REAR POSITION INDICATOR CONTACTS	RPIC	26	
REAR PAWL MAGNET	RPM	2,9,15	
REAR STOP CONTROL SWITCH	RSCC	15	
REAR SAME FLOOR BRUSH	RSFB	8	
REAR SAME FL CONTACTS	RSFC	8	
REAR SEL STOPPING SW	RSLS	10,14,17	
REAR SEL ROCKING CONTACT BRUSH	RSRB	9	
REAR SEL ROCKING CONTACT	RSRC	9	
REAR UP HALL STOP BRUSH	RUHB	20	
REAR UP HALL STOP CONTACTS	RUHC	20	
REAR UP HALL LANT BRUSH	RULB	25	
REAR UP HALL LANT CONTACTS	RULC	25	
REAR AUX ROCKING CONTACT BRUSH	RXRB	9	
REAR AUX ROCKING CONTACT	RXRC	9	
REAR ADVANCER SPEED BRUSH	RASB	12	
REAR ADVANCER SPEED CONTS	RASC	12	

FEATURES

- 700 F.P.M.
- 2 CARS
- W/ MONITOR
- W/ EXECUTONE
- W/ ATTENDANT
- W/ SELECTIVE STOPPING ON HIB. POWER SUPPLY FAILURE
- W/ LEVEL POWER SUPPLY FAILURE INDICATOR
- W/ HALL LANTERNS
- W/ POSITION INDICATORS
- W/ CONTINUOUS & NON-CONTINUOUS INDICATION
- W/ CRT
- W/ ACCESS KEY SWITCHES

DISPATCHING FEATURES

- W/ 3 TERMINAL DISPATCH
- W/ AUTOMATIC INTERVAL ADJUSTMENT

W/ UP PEAK	AUTOMATIC
W/ DOWN PEAK	AUTOMATIC

FOR MINOR FEATURES SEE "NAMES OF FIELD APPARATUS"

LOCATION OF AREAS	
AREA NUMBER	SHEET NO.
1, 2, 3, 4 & 5	1
6, 7, 8 & 9	2
10, 11, 12, 13, 14, 15 & 16	3
17, 18, 19 & 20	4
21, 22, 23, 24 & 25	5
26	6

GENERAL INFORMATION

A- FOR POLARITY IDENTIFICATION ONLY NOT TO BE MARKED ON EQUIPMENT.
B- SYMBOL SHOWN THUS [ ] IN TABLES INDICATES THAT CONTACT IS FURNISHED ON SWITCH. THE NUMBER SHOWN IN SYMBOL REFERS TO THE AREA LOCATION ON STRAIGHT DIAGRAM AND IS PLACED IN THE UPPER LEFT HAND CORNER OF EACH AREA. AN AREA EXTENDS FROM ONE AREA NUMBER TO THE ONE BELOW AND FROM THE CENTER OF THE DIAGRAM TO THE OUTSIDE.
C- ALL VARIABLE ITEMS ARE SHOWN DOTTED.
D- THE ODD NUMBER ON A SYMBOL INDICATES THE FOLLOWING FACING THE FRONT OF CONTROLLER.
(1) THE STATIONARY PART OF A MAIN CONTACT OR THE PART NEAREST THE CONTROLLER PANEL OF AN AUXILIARY CONTACT ON A MAGNET SWITCH.
(2) THE TOP PART OF A FUSE IF IT IS MOUNTED VERTICALLY.
(3) THE LEFT HAND SIDE OF A MAGNET COIL OR FUSE, IF THE FUSE IS MOUNTED HORIZONTALLY.
E- CONNECT ADDITIONAL DOOR & GATE CONTACTS IN SERIES WITH THOSE SHOWN.
F- TERMINAL "HL1" MUST BE CONNECTED TOGETHER ON ALL PIECES OF APPARATUS.
G- THIS SYMBOL "⏚" INDICATES CONNECTIONS TO OTHER SELECTORS.
H- SUFFIX LETTERS ADDED TO MARKINGS INDICATE CONTROLLER LETTERS I.E. BU"A" FOR CONTROLLER "A", BU(B) FOR CONTROLLER "B", ETC.
J- WIRING ENCLOSED BY DOT-DASH LINES INDICATES SUB-ASSEMBLY WIRING.
K- "TLZ"-TOP LANDING OF LOWER ZONE.
"LUZ"-LOWEST LANDING OF UPPER ZONE.
L- ON FOUR LEAD COILS 9 & 10 IS THE INNER WINDING.
ON THREE LEAD COILS 5 & 13 IS THE INNER WINDING.
M- LETTER "M" UNDER A CONNECTION TO A COIL OR CONTACT INDICATES MECHANICAL CONNECTION WHICH CAN NOT BE SEPARATED.

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 23-A4S6987H, SHEET 6.

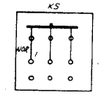
Figure 8-54. System Schematic Diagram (Sheet 6 of 8)

NAMES OF MAIN CONTROLLER APPARATUS	SYMBOL	LOCATION CODE	MAKING CONTACT NUMBERS AND LOCATION								BREAKING CONTACT NUMBERS AND LOCATION							
			1 2	3 4	5 6	7 8	11 12	13 14	11 14	7 4	1 2	3 4	5 6	7 8	9 10	1 4	2 15	4 15	6 19
ADVANCED ADVANCER SWITCH	ADV	10		6 1	20 1		2 1				4 1			2 1					
AUX ADVANCED ADVANCER SWITCH	ADVX	10		16 1			16 1				18 1			27 1					
ATTEND INDEPEND SERVICE SW	AIS	5					18 1				6 1	22 1	20 1	2 1					
AUX ATTEND IND SERVICE SW	AISX	5			1 1						20 1			41					
AUTOMATIC STARTING RELAY	ASR	6		3 1	5 1		6 1				7 1			21					
ATTENDANT SWITCH	ATT	2	5 1	3 1	6 1		3 1												
AUX ATTENDANT SWITCH	ATTX	2	25 1	6 1		2 1	3 1												
AUX ACCESS SWITCH	AUD	2		16 1	16 1		16 1				10 1			16 1					
BRAKE SWITCH	BK	17	11 1	11 1	11 1		15 1	17 1						17 1					
BOTH FRONT & REAR REL	BFR	7	7 1	8 1	35														
BRAKE PULSE RELAY	BPR	11					14 1				11 1			12 1					
POTENTIAL SWITCH	C	10	11 1	11 1	20 1		10 1	10 1						10 1	11 1				
CAR BUTTON SWITCH	CBS	3	9 1	9 1		81													
RECTIFIER POWER UNIT	CRF	9																	
GENERAL PURPOSE TRANSF	CTR	9																	
PLATE TRANSFORMER	CTRP	9																	
CAR BUTTON BIAS PANEL	CVB	9																	
3RD AUX POT SWITCH	CW	10																	
AUX POTENTIAL SWITCH	CX	10		4 1			10 1				4 1		20 1						
2ND AUX POTENTIAL SWITCH	CY	10	11 1	15 1		26 1	10 1						20 1						
TIMED AUX POTENTIAL SWITCH	CZ	10	10 1	10 1		4 1	13 1						10 1						
DOWN DIRECTION SWITCH	D	10		11 1	11 1		20 1				11 1			11 1					
DIRECTION HOLDING SWITCH	DG	5	11 1	11 1	11 1		17 1	17 1						11 1	11 1				
1ST DOWN DIRECTION RELAY	DGD	15		5 1	5 1		15 1				5 1			15 1					
2ND DOWN DIRECTION RELAY	DGE	5		12 1	16 1		14 1				15 1			15 1					
5TH DOWN DIRECTION RELAY	DGF	15		44 1			26 1				22 1			5 1					
				23 1	17 1		42 1				17 1			1					
1ST UP DIRECTION RELAY	DGU	15		12 1	16 1		14 1				15 1			15 1					
2ND UP DIRECTION RELAY	DGV	5		5 1	26 1		6 1							15 1					
4TH UP DIRECTION SWITCH	DGX	5	14 1	9 1		9 1	6 1							5 1					
														9 1					
1ST DOOR OPEN & CLOSE SW	IDO	4					10 1				1 1	10 1	41	1 1					
2ND DOOR OPEN & CLOSE SW	2DO	4		1 1	1 1		5 1				15 1			5 1					
DOOR OPENING LIMIT SWITCH	DOL	4		2 1	3 1		4 1				10 1			2 1					
DOOR PROTECTIVE SWITCH	DP	2	2 1	10 1		4 1	42												
AUX DOWN DIRECTION SWITCH	DX	16	12 1	11 1	15 1		13 1	17 1						83					
DOOR ZONE RELAY	DZA	7		4 1	2 1										13 1	13 1			
1ST SPEED SWITCH	IE	17		11 1	1 1	1 1													
AUX 1ST SPEED SWITCH	1EX	17				1 1	21	17 1							9 1	18 1			
2ND SPEED SWITCH	2E	17		11 1	11 1	1 1	17 1	17 1			87			11 1	18				
3RD SPEED SWITCH	3E	17		11 1	11 1	1 1	11 1	17 1						17 1	18 1				
4TH SPEED SWITCH	4E	17		11 1	11 1	1 1	11 1	17 1							18 1				
ELECTR BUTTON RESET RELAY	EBR	5		9 1	9 1		9 1				9 1				11 1	18 1			
															9				
EXCITATION TIME SWITCH	ETS	5	21 1	15 1		5 1	7 1												
AUX EXCITATION TIME SWITCH	ETSX	5		6 1								4 1							
FRONT ADV CENTERING REL	FAC	7		14 1	14 1		7 1				4 1			4					
AUX FRONT ADV CENTERING REL	FACX	7		9 1							14 1			14 1					
FEEDBACK SWITCH	FBS	14	11 1	11 1	11 1		21	21						41					
FRONT DOOR CONTR REL	FDR	8	16 1	3 1		3 1	4 1							7 1					
FULL SPEED SWITCH	FE	17	11 1	11 1	11 1														
FRONT LEVELING REL	FLV	8	8 1	8 1	13 1	13 1	13 1							35 1	14 1				
AUX FRONT LEVELING REL	FLW	8		13 1	13 1		13 1												
FRONT TO REAR REL	FR	8		13 1	13 1		13 1				8 1			22					
FULL SPEED SWITCH REL	FXE	18		16 1	16 1		16 1				21			261					
GOVERNOR SWITCH	GG	12	12 1	16 1		1					21			27 1					
DOOR CLOSE LIMIT SWITCH	GH	2		25 1	45		8 1												
STOP CONTROL SWITCH	GK	17	11 1	11 1	11 1		11 1	17 1			15 1			G 1					
CAR START RELAY	GO	15		3 1			4 1								18 1				
GATE SWITCH REL	GS	2		4 1	9 1		2 9				3 1	3 1	35 1						
FIELD & BRAKE SW	H	13	10 1	9 1	11 1		17 1	15 1			8 1		8 1		11 1	18 1			
HALL BUTTON FAILURE SW	HBF	2		9 1	9 1		1												
HIGH LOAD COMP REVERSING SW	HC	12	11 1		1 1	1	12 1	1							25+1				
HIGH CAR CALL SW	HG	9		5 1	1 1		16 1				64 1			12 1					
HIGH CALL SWITCH	HJ	6, 20		6 1	3 1						5 1			5 1					
HIGHEST CALL REVERSAL SW	HR	6		5 1	6 1		9 1		20 1		6 1			6 1					
AUX HIGH, CALL REVERSAL SW	HRX	6		25 1	20 1		1				25 1			20 1					
2ND AUX HIGH CALL REV RELAY	HRY	6		20 1	25 1						20 1			25 1					
HALL STOP SWITCH	HS	3,20	9 1	8 1	20 1									1					
FAST SPEED LEVELING SW	HSL	13	25	20 1			11 1	13 1		3 1									
FIELD, BRAKE & DIRECTION SW	HUD	11		2 1	2 0		13 2												
AUX FIELD & BRAKE SW	HX	16	17 1	11 1	11 1		13 1	13 1			17 1			121					
2ND AUX FIELD & BRAKE SW	HY	17	8 1	8 1	8 1	2 1	11 1							4 1	4 1				
INSPECTION SW. NO. 1	IINS	2		3 1	16 1		13 1							2 1					
INSPECTION SW. NO. 2	IINS	2		17 1			14 1				16 1								
INDEPENDENT SERVICE SW	IS	2		21 1	5 1		21 1				16 1	17 1	7 1						
AUX INDEPENDENT SERVICE SW	ISX	2		6 1	24		31				11 1		7 1						
											84		21						
RUNNING SWITCH	K	7		6 1	7 1		7 1				26 1			7 1					
3POT KNIFE SWITCH	KS	10																	
STAR SWITCH	L	7	1 1		1 1		7 1	2 1											
LEVELING APPROACH SW	LA	11		14 1	16		11 1				18			1 1					
LEVELING AT FRONT REL	LAF	7	9 1	9 1		8 1	8 1							46					
LEVELING AT REAR REL	LAR	7	9 1	9 1		8 1	8 1					9 1							
LEVELING APPROACH TIME SW	LAT	14		1 1	14 1		1				11 1			5 1					
AUX LEVEL APPROACH TIME SW	LATX	14		82 1			6 1				1		13 1	13 1					
LOW LOAD COMP REVERSING SW	LC	12	11 1	1 1	11 1		12 1	1						12 1	1				
LEVELING INITIATING REL	LI	7		16 1	1														
LOAD NON-STOP SW	LNS	6	23 1	6 1		3													
LIGHT RAY RELAY	LRC	2		3 1	1	1	1 1	1 1											
LOAD WEIGHING TIME SW	LWT	14	12 1	12 1	11 1	12 1	14 1												
AUX LOAD WEIGHING TIME SW	LWX	14					11 1				12 1	12 1	12 1	12 1					
LEVELING RELAY	LX	13		2			1				1	2 1	2 1	1					
DELTA SWITCH	M	7	1 1	1 1	1 1		10 1	1 1						7 1	7 1				
1ST MIN CURR SHUNT FLD REL	MC	10								7 0					7 1	7 0			
2ND MIN CURR SHUNT FLD REL	2MC	10								13 0						13 0			
MAIN LANDING SWITCH	ML	5	10 1	41		41	61					3 3							
MAIN LANDING UP SW	MLU	6		11 1	41		61												
NON-STOP SW	NS	6	25 1	9 1		6 1	6 1				20 1		6 1	20 1					
AUX NON-STOP SW	NSX	6		20 1	20 1														
CAR TIME SWITCH	NT	3																	
AUX HALL TIME RELAY	NTX	3	6 0	1		17	31						6 0						
ONE FLOOR RUN SWITCH	OFR	11	11 1	11 1	11 1		11 1	11 1			7 1		8 1	8 1					
DRIVING MOTOR PROT RELAY	IP	1													11 1	11 1		11 1	11 1
DRIVING MOTOR PROT RELAY	2P	1									7 1								
GENERATOR PROTECTIVE REL	3P	1									7 1								
POWER FAILURE INDICATOR	PFI	1									7 1								
AUX PAWL MAGNET SWITCH	PMY	15			1		7 1				26 1		26 1	26 1					
PAWL MAGNET RELAY	PMX	15			7 1		14 1				15 1		21	20 1					
3RD AUX PAWL MAGNET REL	PMZ	15			15 1	16 1	8 1							16 1					
					8 1		1						8 1	8 1					
1ST RELEVELING EXCITATION SW	1RL	18			18	11	18				18			11					
2ND RELEVELING EXCITATION SW	2RL	18			11		18				18			11					

NAMES OF MAIN CONTROLLER APPARATUS (CONT'D)	SYMBOL	LOCATION CODE	MAKING CONTACT NUMBERS AND LOCATION								BREAKING CONTACT NUMBERS AND LOCATION							
			1 2	3 4	5 6	7 8	11 12	13 14	11 14	7 4	1 2	3 4	5 6	7 8	9 10	1 4	2 15	4 15	6 19
REAR ADV'R CENTERING REL	RAC	7		14 1	14 1		7 1				14 1			2 1					
AUX REAR ADV'R CENTERING REL	RACX	7		9 1										14 1					
REAR ADVANCED ADV SW	RADV	10		6 1	20 1		9 1				4 1			41					
AUX REAR ADVANCED ADV SW	RADVX	10		16 1			16 1				31			21					
INTERMEDIATE LOAD COMP SW	RC	12	11 1	11 1	11 1		13 1							71					
REAR CAR BUTTON SW	RCBS	9	3 1	3 1	8	41											11 1		
REAR 1ST DOOR OPEN & CLOSE SW	RIDO	4					15 1												
REAR 2ND DOOR OPEN & CLOSE SW	R2DO	4		1 1	1 1		15 1				11 1	10 1	41	1 1					
REAR DOOR OPEN LIMIT SW	RDOL	4		2 1	3 1		4 1				15 1			5 1					
REAR DOOR PROTECTIVE SW	RDP	2	2 1	4 1		10	42				10 1			2 1					
REAR DOOR CONTROL REL	RDR	8		3 1			4 1												
REAR DOOR ZONE RELAY	RDZR	7		5 1	7 1						7 1			7 1					
REACTOR	REA	1,10																	
RECTIFIER	RF	9																	
FRONT TO REAR RELAY	RFA	8																	
RESIDUAL FIELD SWITCH	RFS	15		16 1	8 1		81				21			251					
REAR DOOR CLOSE LIMIT SW	RGH	2		11 1	11 1		13 1				11 1			11 1					
REAR GATE SWITCH	RGS	2		23 1	4 P		9 1				15 0			6 P					
				41	31		21				82			13 P					
REAR HIGH CAR CALL SWITCH	RHG	9		5 1	6 1		6 1				5 1			24 1					
REAR HIGH CALL SWITCH	RHJ	6,20		5 1	6 1					20 1	5 1			5 1					
REAR HALL STOP SWITCH	RHS	3,20	9 1	8 1	20 1	41					6 1			221					
REAR LEVEL'G INITIATING REL	RLI	7		16 1	1					1 1									
REAR LIGHT RAY RELAY	RLRC	2		3 1	1	1	1 1	1 1											
REAR LEVELING REL	RLVR	8	8 1	8 1	13 1	13 1	13 1												
AUX REAR LEVELING REL	RLW	8		13 1	13 1		13 1				8 1			251					
REAR LEVELING RELAY	RLX	13		1			1				1			16 1					
DOOR REOPEN RELAY	RO	3	4 1		1						1		7 1	7 1					
AUX REAR PAWL MAGNET REL	RPMX	15		15 1	16 1		6 1												
2ND AUX REAR PAWL MAGNET REL	RPMY	15		7			14 1				16 1			21	20 1				
3RD AUX REAR PAWL MAGNET REL	RPMZ	15		8 1			1				15 1			8 1	8 1				
REAR CAR REACTOR	RREA	1,10																	
RECTIFIER	RRF	1																	
REAR RECTIFIER	RRRF	1																	
REAR STOP CONTROL REL	RSE	2,15	17 1	12 1		1		15 1											
REAR MON SAFETY SHOE SW	RSG	3		3 1	4 P		3 1								14 1				
RUNNING RELAY	RUN	6		3 1			6 1				1 1			1					
AUX RUNNING RELAY	RUNX	6		3 1			2				5 1			9 1	6 1				
REAR CAR BUTT STOP RELAY	RXCB	9									1			9 1	1				
REAR HIGH, CAR CALL RELAY	RXHG	9													18 1				
REAR HIGH, CALL RELAY	RXHJ	20													11 1	18 1			
REAR HALL STOP RELAY	RXHS	20													9				
SELECTION RELAY	SC	6		20 1	6 P		20 1				6 1			1					
TOP SELECTION RELAY	SCT	6		25 1			23 1				6 1			1					
AUX SELECTION RELAY	SCX	6		2 1	25 1		24 1				1			1					
STOP CONTROL RELAY	SE	2,15	12 1	17 1		1		15 1						14 1					
SERIES FIELD SWITCH	SF	1												24 1					
SAME FLOOR RELAY	SFR	8	9 1	9 1		8 P	8 1				11 1			11 1					
MONITOR SAFETY SHOE SWITCH	SG	3		3 1			3 1							6 P					
FULL LOAD COMPENSATION SWITCH	TC	3		3 1			3 1				3 1			1					
LEVELING SWITCH RELAY	TL	13	11 1	11 1	11 1		13 1	11 1						1					
TOP FLOOR RELAY	TLR	5	11 1	8 1		11 1	5							1			11 1		
RECTIFIER TRANSFORMER	TRF	5	5 1	6 1		6 1	6							1					
UP DIRECTION SWITCH	U	13	11 1	11 1	11 1		17 1	11 1						1					
UP DISPATCHING RELAY	UDR	6		6 1	24 1		24 1				6 1			23 1					
AUX UP DISP RELAY	UDRX	6		6 1	24 1		24 1				23 1			24 1					
2ND AUX UP DISP RELAY	UDS	2,6		26 1			4 1				26 1			24 1					
AUX UP DIRECTION SWITCH	UX	16	11 1	11 1	15 1		13 1	17 1						11 1	11 1				
CAR BUTTON STOP RELAY	XCB	9												1	18 1				
DELAYED CAR CUTOUT SWITCH	XCS	5	2 1	10 1		3 1	10 1							25+1					
AUX DELAYED CAR CUTOUT SWITCH	XCSX	2	4 P	20 1	20 1	4 P	3 1												
M.G. START & DOOR OPEN SWITCH	XDO	3		4 1	20 1		5 1				18 1			2 P					
1ST SPEED SWITCH RELAY	1XE	18		18 1							17 1			17 1					
2ND SPEED SWITCH RELAY	2XE	18		17 1			1				17 1			17 1					
3RD SPEED SWITCH RELAY	3XE	18		18 1			1				17 1			18 1					
4TH SPEED SWITCH RELAY	4XE	18		18 1			1				17 1			18 1					
FRONT LEVELING TRANSFER RELAY	1XL	8		8 1	8 1		3 1				17 1			18 1					
HIGHEST CALL RELAY	1HG	9									1			1					
HIGHEST HALL CALL RELAY	1HJ	20																	
HALL STOP RELAY	1HS	20																	
DELTA SWITCH RELAY	1M	7	10 1	1 1		7 1	26 1												
MOTOR FIELD SWITCH	XMC	15	10 1		10 1			11 1						7 1					
REAR LEVELING TRANSFER RELAY	1RL	8		8 1	8 1		3 1				8 1				18 1				
															2				
FUSES 1, 2 & 3		1																	
FUSES 61, 66, R61 & R66		1																	
FUSES 4 & 5		2																	
FUSES 9		25																	
FUSES 62, 63, 64 & 65		3																	
FUSES 6, 7, 8 & 12		10																	
FUSES 21, 23, 73, R71, R22 & R23																			
FUSES 13, 14 & 15		11																	
FUSE 17		26																	
FUSE 16		17																	
FUSES 21 & 22		26																	
2ND AUX ACCESS SW	AUDX	2			1			2				8			10 P		8		
INSPECTION SW NO. 3	3INS	2			3 P			2				2 P					2 P		
AUX MAIN LANDING SW	MLX	5			2 P	2		2 P				7 1			6 P		7 1		
DIFFERENT RELEASE RELAY	DR	2			10 P			8 P				2 P			2 P		2 P		
REAR FRONT GATE RELAY	RFG	2			8 P	2	13	2 P				2 P			2 P		2 P		
AUX FRONT DOOR CONTR RELAY	FDRX	8			8 P	1		9 P				1							
REAR HG START & DOOR OPEN SW	RADO	3			4 P	5		20 3							12 P		2 P		
AUX HIGH CALL SW	HJX	3			8 P	8		8									2 P		
REAR AUX HIGH CALL SW	RHJX	3			8 P	8		8											
CAR CALL STOP RELAY	CHS	4	3 P	3 P	3	20 1	20 1								3 P				
5TH AUX PAWL MAGNET RELAY	PMZA	15		16 P	3		9 P												
4TH AUX REAR PAWL MAGNET RELAY	RPMA	15		16 P	3		9 P								12 P				
REAR-FRONT-REAR RELAY	RFR	8		16 P	4 P		9								3 P				
															3 P				
REAR AUX DOOR CONTROL RELAY	RDRX	8			16 P	8 P	3 P												
AUX SAME FLOOR RELAY	SFRX	8					11 P								3 P	3 P			
ONE-TIME TRANSFER RELAY	OTT	8			1	1	8 P								8 P				
NEXT LANDING REAR RELAY	NLR	12			8 P	2	12 P								14 P				
NEXT LANDING FRONT RELAY	NLF	12			8 P	2	12 P								14 P				
AUX HIGH CALL SW RELAY	XHR	8													8 P				
1 3RD EMERGENCY STOP RELAY	3ES	2			1	1		1											
1 EMERG. SERVICE INITIATING SW.	FESX	8			8 P	8 P		8							4 P	8 P			
1 AUX EMERG. SERVICE RELAY	FESX	8			8 P			8							2 P				
1 2ND EMERG. SERVICE REL.	2FES	8					11 P	8							2 P	2 P			
1 2ND AUX MAIN LANDING SW.	MLY	11		8 P	8 P	8 P	8 P												
					3 P	3 P		8											

1 MOUNTED ON EXTENDED PANEL ON MAIN CONTR.

LOCATION OF AREAS	
AREA NUMBER	SHEET NO.
1, 2, 3, 4 & 5	1
6, 7, 8 & 9	2
10, 11, 12, 13, 14, 15 & 16	3
17, 18, 19 & 20	4
21, 22, 23, 24 & 25	5
26	6



LOCATION OF WIRES FROM EXTENDED PANEL ON MAIN CONTROLLER

AREA NO.	"J" MARKINGS
2	J1, J2, J5 TO J8
3	J8, J4
4	J9 TO J12
5	J1, J18 TO J19, J22, J23
6	J20, J21, J30, J31
9	J3, J24, J28
11	J1, J24
25	J26, J26

NAMES OF FIELD APPARATUS	SYMBOL	LOCATION	VAR ITEM
ATTENDANT CUTOUT SWITCH	ATS	2	
BRAKE	B	11	
BOTTOM ACCESS KEY SW	BAK	16	
BRAKE OPERATED SWITCH	BS	12	
BROKEN TAPE SWITCH	BTS	10	
BUZZER	BU	25	
CAR BUTTONS	CB	9	
CAR DOWN DIRECTION LGT	CDL	26	
CONTROL INSPECTION BUTTON	CIB	16	
CAR POSITION INDICATOR	CPI	26	
COMPENSATING SHEAVE SW	CSS	10	
CAR UP DIRECTION LIGHT	CUDL	26	
DOOR CLOSE BUTTON	DCB	3,5	
AUX DOOR CLOSE BUTTON	IDCB	3	
DOWN DISPATCH LIGHT (CAR)	DDC	26	
DOWN DISPATCHING GONG	DGN	26	
DOOR MOTOR ARMATURE	DMA	1	
DOOR MOTOR FIELD	DMF	2	
DOOR OPEN BUTTON	DOB	4	
AUX DOOR OPEN BUTTON	IDOB	4	
DOOR CONTROL BOX	DOCB	2,4,8,10, 15,16	
DOWN PEAK LIGHT	DPL	25	
DOOR CONTACTS	DS	16	
DRIVING MOTOR	DV	1	
EXCITER ARMATURE	EA	10	
EMERGENCY CALL BUTTONS	ECB-IECB	26	
EXCITER SHUNT FIELD	EF	10	
EMERG POWER SUPPLY LIGHT	EPL	25	
EMERG POWER SUPPLY SEL SWITCH	EPS	23	
EMERGENCY STOP SW. NO. 1	IES	5,10	
EMERGENCY STOP SW. NO. 2	2ES	5,10	
EXCITER SERIES FIELD	ESF	10	
GENERATOR ARMATURE	GA	11	
GEN COMPENSATING FIELD	GCF	11	
MAIN GENERATOR FIELD	GF	11	
GENERATOR INTERPOLE FIELD	GIP	11	
GENERATOR LEVELING FIELD	GLF	11	
GENERATOR SERIES FIELD	GSF	11	
HALL TOUCH BUTTONS	IH-ETC	20	
HALL DOWN DIRECTION LGT	HDDL	26	
HALL LANTERNS	HL	25	
HALL POSITION INDICATOR	HPI	26	
HALL UP DIRECTION LIGHT	HUDL	26	
INSPECTION INITIATING KEY SWITCH	IIS	2	
INTERMITTENT LIGHT	IL	25	
INDEPENDENT SERVICE CUTOUT SWITCH	ISS	2	
LOADING LIGHT	LL	25	
LIGHT RAY CONTROL UNIT	LRCU	1,3	
LIGHT RAY CUTOUT SWITCH	LRCS	2	
DOWN FINAL LIMIT SW	FLS	10	
UP FINAL LIMIT SW	2LS	10	
LOAD WEIGHING PLATE SWS	LW-ETC	6,12	
ELEVATOR MOTOR ARMATURE	MA	11	
ELEVATOR MOTOR SHUNT FLD	MF	10	
M.G. SET START SW. NO. 1	1MGS	7	
M.G. SET START SW. NO. 2	2MGS	7	
ELEVATOR MOTOR INTERPOLE	MIP	11	
NORMAL POWER SUPPLY LIGHT	NPL	25	
NON-STOP BUTTON	NSB	6	
MAIN LINE GOVERNOR SW	L

SYMBOLS OF ELECTRONIC & DISPATCHING CONTROLLER APPARATUS	SYMBOL	LOCATION CODE	MAKING CONTACT NUMBERS AND LOCATION							BREAKING CONTACT NUMBERS AND LOCATION							
			J 2	3 4	5 6	7 8	11 12	13 14	11 14	7 4	1 2	3 4	5 6	7 8	9 10	1 4	2 15	4 15	6 19
AUTO PEAK SELECTION	APS	24																	
AUTO UP TIMING PANEL	AUT	24																	
THERMOSTATIC DELAY RELAY	AM	19																	
CONTINUOUS CALL RELAY	CC	21		21															
AUX CONTINUOUS CALL RELAY	CCX	21		20			21									21			
DOWN PEAK SWITCH	DPS	23																	
AUX DOWN PEAK SWITCH	DPSX	23		25															
DOWN TIMING RELAY	DTR	23	23									23							
ENERG. POWER SUPPLY REL (A-B)	EP	23		7	25														
RECTIFIER PANEL	IERP	19																	
UP FLOOR RELAY	IFU-ETC.	19	25																
GROUP CAR RUNNING RELAY	GCR	21			21		22				22								
GROUP DOWN DISPATCHING SW	GDD	23			20		23												
GROUP UP DISPATCHING SW	GUD	23					24				6	6		24					
HALL BUTTON RECTIFIER	HBRF	19																	
HALL BUTTON TRANSFORMER	HBTR	19																	
HALL CONTROL PANELS	IHC-ETC.	20																	
HALL CALL RELAY	HCR	20	21																
HALL CALL SWITCH	HCS	21					21				22		21	21					
GENERAL PURPOSE TRANSFORMER	HTR	19																	
LIGHT TRAFFIC SW	LT	23																	
LOW ZONE CALL SWITCH	LZC	19	22								21		21						
KEY SWITCH	MGCS	21										22							
M.G.SET PREFERENCE SW	MGP	21					24				6	6							
M.G.SET TIME RELAY	MGT	21		21															
AUX M.G.SET TIME RELAY	MGTX	21	2	2			21									27			
MAN-AUTO PK SELECTION SW	MSS	23		23	23														
MANUAL UP-DOWN SW	MUD	23		21	21														
NORMAL POWER RELAY	NP	23	7	7		25	25						23						
NO UP STOP SWITCH	NUS	23					22				20	20	20	20					
POWER KNIFE SWITCH	PKS	19																	
POWER SUPPLY TEST RELAY	PSS	20	20		21							20							
POWER SUPPLY TEST PANEL	PST	20																	
POWER SUPPLY TEST SW	PSX	21									2	2							
REAR UP FLOOR RELAY	RIFU-ETC.	19	25																
REAR DOWN FLOOR RELAY	RIFD-ETC.	19		25															
REAR HALL CONTROL PANELS	RIHC-ETC.	20																	
REGULAR POWER RELAY	XP	23		CPH															
TEST PANEL	TE	19																	
DOWN FLOOR RELAY	TFD, UFD-ETC.	19		22 25															
SIGNAL TRANSFORMER	TRL	19																	
AUX UP DOWN SWITCH	UDX	21		25															
UP PEAK SWITCH	UP	23	6	6			24				25								
AUX UP PEAK SWITCH	UPX	23			25								21						
AUTO UP TIMING RELAY	UT	24	23								25								
GROUP CUTOUT SWITCH	WLG	22	22		22							23							
AUX GROUP CUTOUT SWITCH	WLGX	22	6	6							22		25						
AUTO DOWN PEAK RELAY	XDP	24	23								23								
AUTO UP PEAK RELAY	XUP	24	23								23								
ZONE RETURN SWITCH	ZR	22		9	9		22				25			20					
1ST AUX ZONE RETURN SW	ZRA	22									20	20	20	20					
2ND AUX ZONE RETURN SW	ZRB	22									20	20	20	20					
RESISTOR & RECTIFIER PANELS	ZRP / IZRP- / SZRP	19																	
3RD AUX ZONE RETURN RELAY	ZRU	22									20	20	20	20					
4TH AUX ZONE RETURN RELAY	ZRV	22									20	20	20	20					
5TH AUX ZONE RETURN RELAY	ZRW	22									20	20	20	20					
6TH AUX ZONE RETURN RELAY	ZRX	22						23			20	20	20	20					
7TH AUX ZONE RETURN RELAY	ZRY	22									20	20	20	20					
8TH AUX ZONE RETURN RELAY	ZRZ	22									20	20	20	20					
FUSE 55		25																	
FUSES 51,52,53,54,56,57 & 58		19																	

NOTES

NOTE NO. 1- ZONE TO CONNECT IN SERIES ONLY THOSE CONTACTS FOR LANDINGS WHICH ARE PRESENTLY IN USE.

NOTE NO. 2- ZONE TO LOCATE IN REAR RISER AT SAME LEVEL AS FRONT RISER.

NOTE NO. 3 - CONNECT CAR BUTTONS IN CAR OPERATING PANEL NO. 2 IN PARALLEL WITH THOSE SHOWN FOR CAR OPERATING PANEL NO. 1

NOTE NO. 4-CONNECT TERMINAL 2 TO TERMINAL 4 AND TERMINAL 1 TO TERMINAL 3 ON "MLD" SWITCH.

NOTE NO. 5-CONNECT TERMINAL 11 TO TERMINAL 12 ON "AUT" PANEL.

NOTE NO. 6 - FLOOR BARS TO BE WIRED FOR ALL FLOORS ALLOWING FOR FIELD ADJUSTMENT.

NOTE NO. 7-DIAGRAM IS ARRANGED FOR ELEVATOR "A" OF A 2 CAR GROUP.
FOR ELEVATOR "B" SEE CIRCUITS ADJACENT TO ELEVATOR "A" CIRCUITS.

NOTE NO. 9-CONNECTIONS FOR LANDINGS NOT SHOWN SAME AS SHOWN FOR 3RD LANDING.

NOTE NO. 10- CONNECTIONS FOR REAR LANDINGS NOT SHOWN SAME AS SHOWN FOR 3RD LANDING.

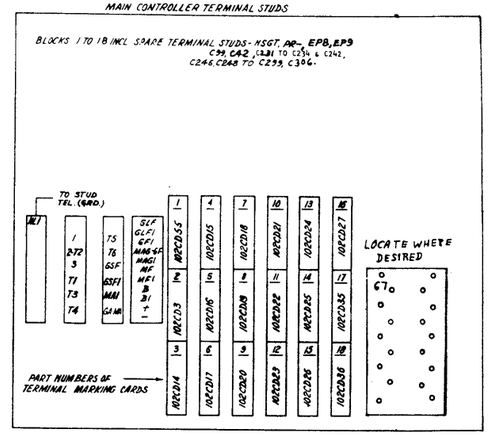
NOTE NO. 11- FACTORY TO CONNECT JUMPERS ON CONTRACTS 301038, 301039 & 301046 BETWEEN STUDS C217 & C218, C235 & C236, C187 & C188 & C201 & C202. WHEN THESE ELEVATORS ARE TO BE RUN AS TWO CAR GROUPS, ZONE IS TO REMOVE THESE JUMPERS.

NOTE NO. 12- CONNECTIONS OF BREAKING CONTACTS FOR ZONE RETURN FOR LANDINGS NOT SHOWN SHOULD BE WIRED BETWEEN STUDS 3 & 10 ON THE "HNC" OR "HNCH" PANELS AS SHOWN IN TABLE BELOW.

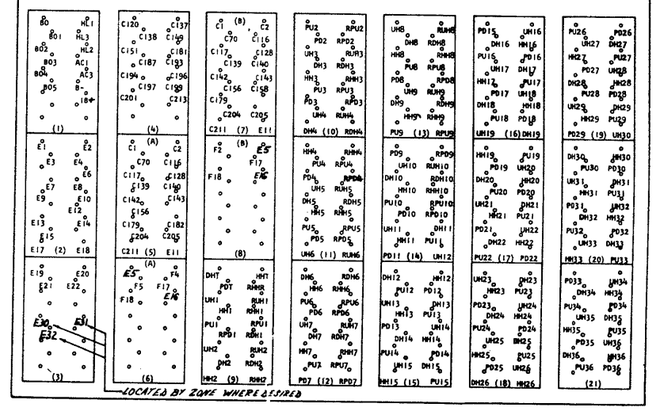
LANDING PANEL	CONTACT	
4HC	ZRA	5-6
RHC	ZRY	5-6
5HC	ZRA	7-8
R5HC	ZRY	7-8
6HC	ZRB	1-2
7HC	ZRB	3-4
8HC	ZRB	5-6
9HC	ZRB	7-8
10HC	ZRU	1-2
11HC	ZRU	3-4
12HC	ZRU	5-6
13HC	ZRU	7-8
14HC	ZRV	1-2
15HC	ZRV	3-4
16HC	ZRV	5-6
17HC	ZRV	7-8
18HC	ZRW	1-2
19HC	ZRW	3-4
20HC	ZRW	5-6
21HC	ZRW	7-8
22HC	ZRX	1-2

MAIN CONTROLLER TERMINAL STUDS

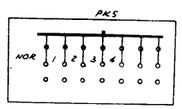
BLOCKS 1 TO 18 INCL SPARE TERMINAL STUDS - MSGT, AR- EP8, EP9
C99, CA2, (3) TO C234 & C242,
C246, C248 TO C299, C306.



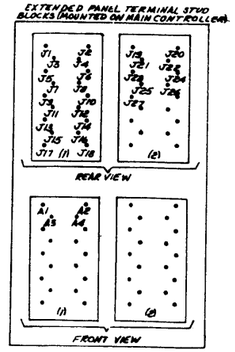
ELECTRONIC CONTROLLER TERMINAL BLOCKS



LOCATION OF AREAS	
AREA NUMBER	SHEET NO.
1,2,3,4 & 5	1
6,7,8 & 9	2
10,11,12,13,14,15 & 16	3
17,18,19 & 20	4
21,22,23,24 & 25	5
26	6



EXTENDED PANEL TERMINAL STUD BLOCKS MOUNTED ON MAIN CONTROLLER

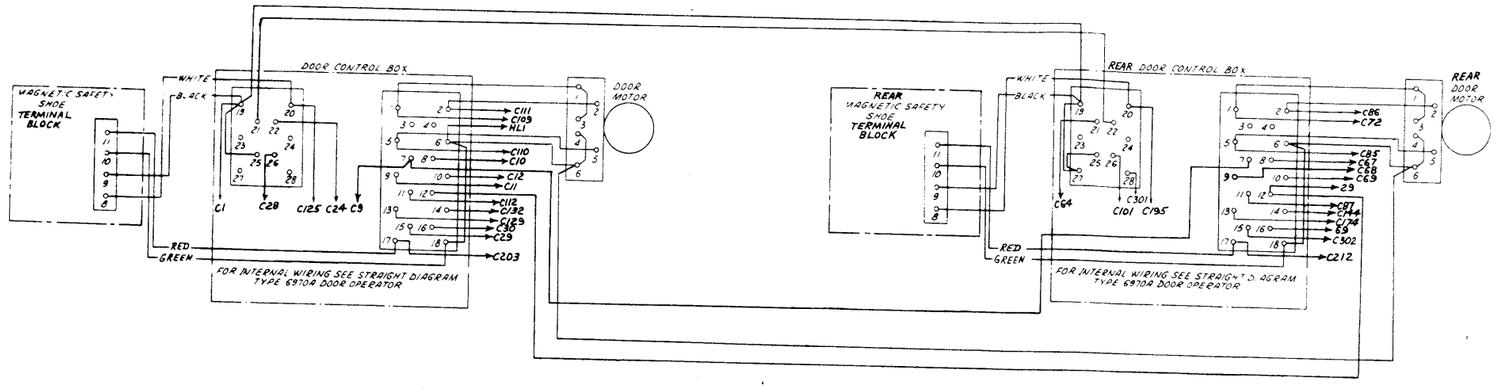


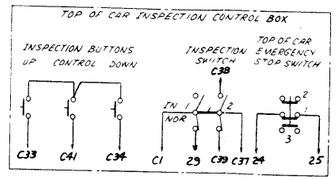
NOTE:

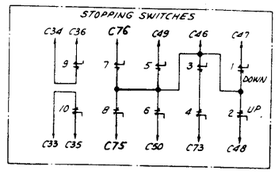
THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 23-A4S6987H, SHEET 8.

Figure 8-54. System Schematic Diagram (Sheet 8 of 8)

CAR WIRING





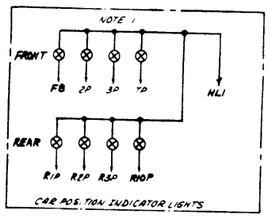


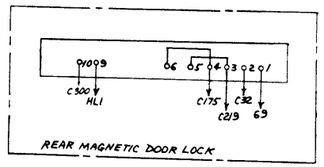
NOTE 8

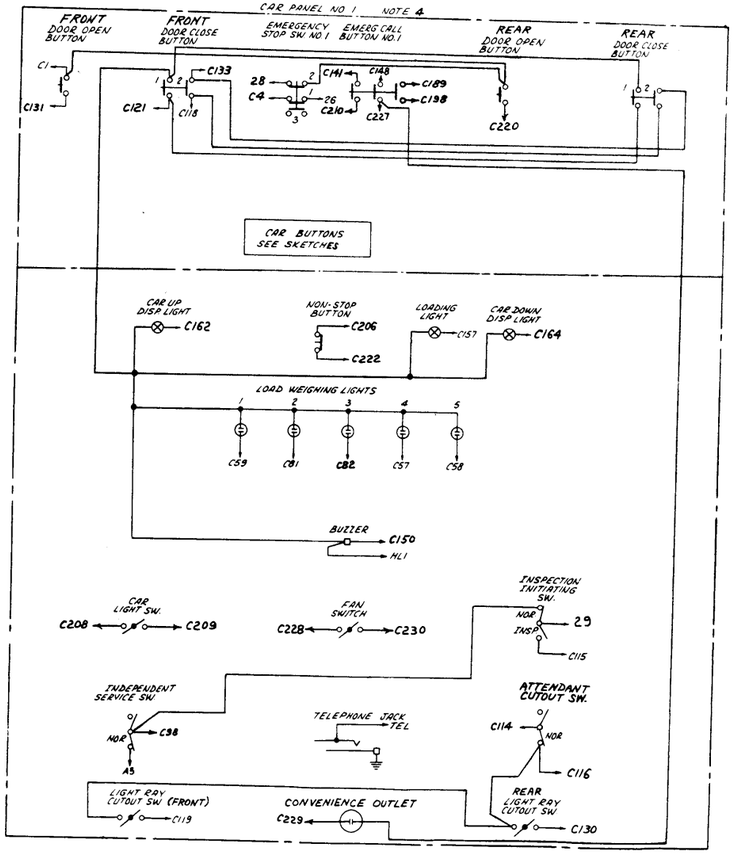
CAR TRAVELING CABLE WIRES

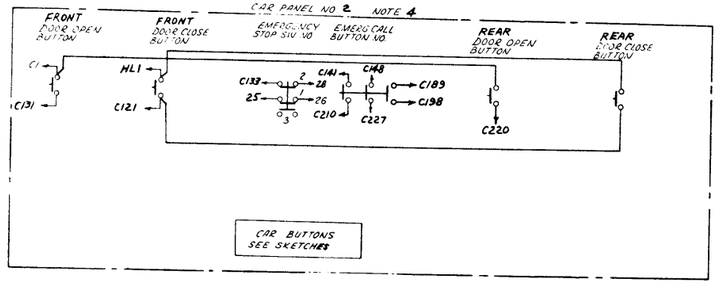
TO MAIN CONTR	COLOR	TO MAIN CONTR	COLOR
HL1		C203	
TEL		C206	
		C207	
C1		C210	
C4		C212	
C9		C216	
C10		C219	
C11		C220	
C12		C222	
C24			
C28			
C29			
C30			
C32			
C33			
C34			
C35			
C36			
C37			
C38			
C39			
C41			
C46			
C47			
C48			
C49			
C50			
C57			
C58			
C59			
C64			
C67		TO SEL.	COLOR
C68			
C69			
C72		F1	
C73		F8	
C74			
C75		TP	
C81		2P	
C82		3P	
C83		4P	
C84		5P	
C85		ETC.	
C86			
C88		R1P	
C101		R2P	
C109		R3P	
C110		R4P	
C111		R5P	
C113		R6P	
C114		R7P	
C115		R8P	
C116		R9P	
C118		R10P	
C119			
C121		CAT	
C131		CA1	
C125		CA2	
C126		CA3	
C127		CA4	
C129		CA5	
C130		ETC.	
C133			
C132		RCA1	
C133		RCA2	
C141		RCA3	
C144		RCA4	
C150		RCA5	
C157		RCA6	
		RCA7	
C162		RCA8	
		RCA9	
C164		RCA10	
C165			
C174			
C175			
C176			
C177			
C178			
C195			
C198			
C199			
C202			
C209			
C217			
C218			
C219			
C220			
C227			
C230			
C87			
C112			
C189			
C4200			
C4201			
C4202			
AB			

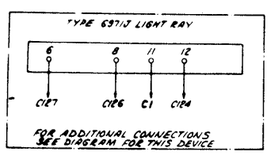
THE NUMBER OF TERMINAL STUDS REQUIRED IN THE CAR JUNCTION BOX EQUAL THE NUMBER OF CAR TRAVELING CABLE WIRES PLUS 7 FOR CAR INTERCONNECTION STUDS 24,25,26,28,29,69 & 19 (NOTE 4)

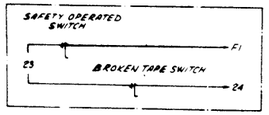


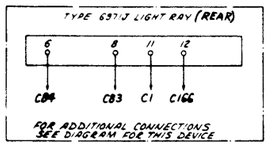


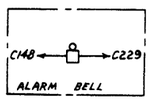


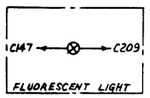


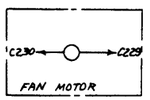


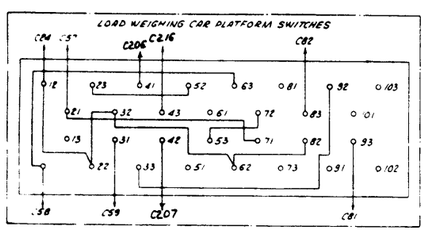


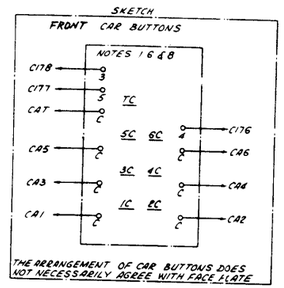


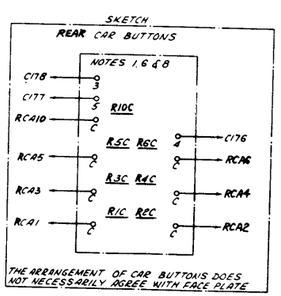












NOTES

NOTE 1 - CONNECTIONS FOR LANDINGS NOT SHOWN SAME AS SHOWN FOR 3RD LANDING.

NOTE 2 - ZONE TO CONNECT IN SERIES ONLY THOSE SELECTOR CONTACTS FOR LANDINGS WHICH ARE PRESENTLY IN USE.

NOTE 3 - ZONE TO REMOVE FACTORY JUMPERS BETWEEN STUDS C217 & C218, C235 & C236, C187 & C188 & C201 & C202 WHEN ELEVATORS ON CONTRACTS 301038, 301039 & 301046 ARE TO BE RUN AS TWO CAR GROUPS.

NOTE 4 - THE CAR OPERATING PANELS MUST BE GROUNDED TO THE CAR FRAME & THE FRAME GROUNDED BY WIRE 19 TO THE HOISTWAY JUNCTION BOX. ALSO SEE NOTE 5.

NOTE 5 - THE FOLLOWING WIRES ARE HEAVIER THAN #18 WIRE: 8,81, EXF,GA,GA1, GCF,GCF1,GF,GF1,GLF,GLF1,GSF,GSF1,MA,MA1,MAG,MAG1,MF,MF1,MIP,T1,T2,T3,T4,T5,T6,*,-,19.

NOTE 6 - CONNECT CAR BUTTONS IN CAR PANEL NO. 2 IN PARALLEL WITH THOSE IN CAR PANEL NO. 1.

NOTE 8 - SEE TECHNICAL ARTICLE X-5-2 FIELD WIRES IN ELECTRONIC CIRCUITS.
(1) HALL BUTTON WIRES
(2) ELECTRONIC CAR BUTTONS
(3) ALL MARKINGS INDICATED THUS [ ]

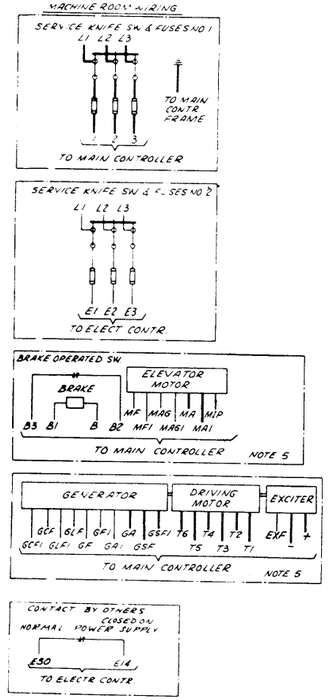
GENERAL INFORMATION

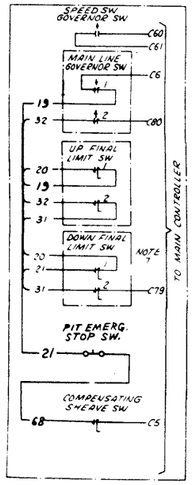
A - ADDITIONAL DOOR & GATE CONTACTS ARE TO BE CONNECTED IN SERIES WITH THOSE SHOWN.
B - ALL WIRES MARKED THUS—CONNECT TO CAR JUNCTION BOX.
C - TERMINAL HL1 MUST BE CONNECTED TOGETHER ON ALL PIECES OF APPARATUS.

NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 23-A4F6987H, SHEET 1.

Figure 8-55. System Wiring Diagram (Sheet 1 of 2)





MACHINE ROOM INTERCONNECTIONS
NOTE 8

MAIN CONTROLLER TO FRONT SELECTOR								
HL1		C1	C7	C8	C13	C14	C15	C16
C17	C18	C19	C20	C21	C22	C23	C24	C25
C26	C27	C43	C44	C45	C51	C53		C90
C91	C103	C104	C105	C106	C107	C134	C135	C136
C153	C154	C159	C165	C167	C168	C169	C170	C171
C172	C173	C180	C190	C191	C192		C243	C245
					C303	C304	C305	
ELEVATOR "A"								
C158								

MAIN CONTROLLER TO REAR SELECTOR								
HL1		C1	C5	C7	C13	C21	C22	C27
C46	C52	C54	C55	C56	C65	C66	C71	C74
C77	C78	C88	C89	C92	C93	C94	C95	C96
C97			C100	C102	C145	C152	C155	C165
	C172	C173	C183	C185	C186	C224	C225	C226
C237	C238						C244	C247
					C303	C304		

ELECTRONIC CONTROLLER TO MAIN CONTROLLERS									
COMMON TO ALL ELEVATORS									
HL1	HL2	AC1	AC3	B03	B−				
C120	C137	C138	C149	C151	C181	C193	C194	C196	
C197	C199	C213							
PER ELEVATOR									
C1	C2	C70	C116	C117	C128	C139	C140	C142	
C143	C156	C179	C211	C204	C205				
ELEVATOR "A"									
C182	C187	C201							
ELEVATOR "B"									
C158									

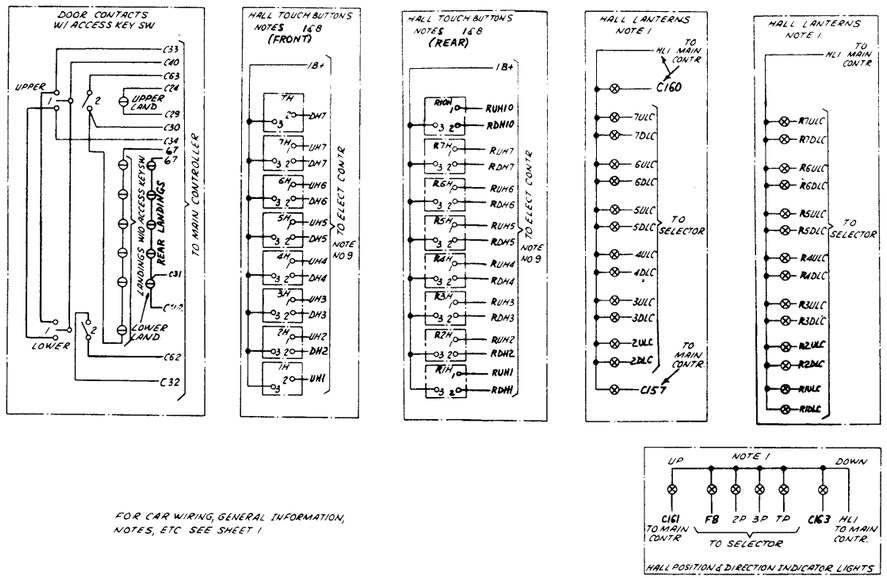
ELECTRONIC CONTROLLER TO FRONT SELECTORS									
COMMON TO ALL ELEVATORS									
UH1	UH2	UH3	UH4	UH5	ETC.				
DH1	DH2	DH3	DH4	DH5	ETC.				
HH1	HH1	HH2	HH3	HH4	ETC.				
PER ELEVATOR									
F17									
ELEVATOR "A"									
F4									
ELEVATOR "B"									
F2									

ELECTRONIC CONTROLLER TO REAR SELECTORS									
COMMON TO ALL ELEVATORS									
RUH1	RUH2	RUH3	RUH4	TO RUH10					
RDH1	RDH2	RDH3	RDH4	TO RDH10					
RHH1	RHH2	RHH3	RHH4	TO RHH10					
RHHR									
PER ELEVATOR									
F18									
ELEVATOR "A"									
	F5								

FRONT SELECTOR TO REAR SELECTOR									
F3		F11	F12	F13	F14	F15	F16		

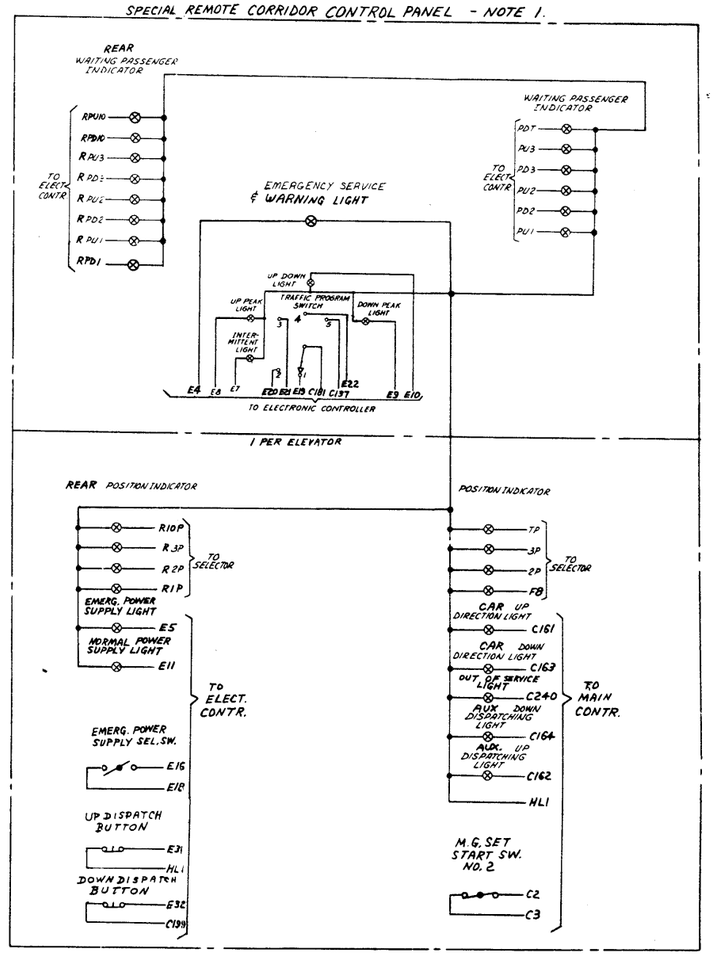
MAIN CONTROLLER "A" TO MAIN CONTROLLER "B"									
C184	C187	C188	C200	C201	C202	C217	C218	C221	
C223	C235	C236	C239	C241					

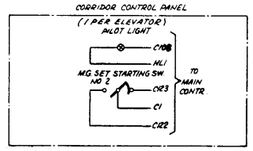
HOISTWAY WIRING

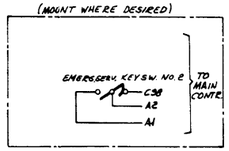


FOR CAR WIRING, GENERAL INFORMATION, NOTES, ETC SEE SHEET 1

SPECIAL REMOTE CORRIDOR CONTROL PANEL - NOTE 1.



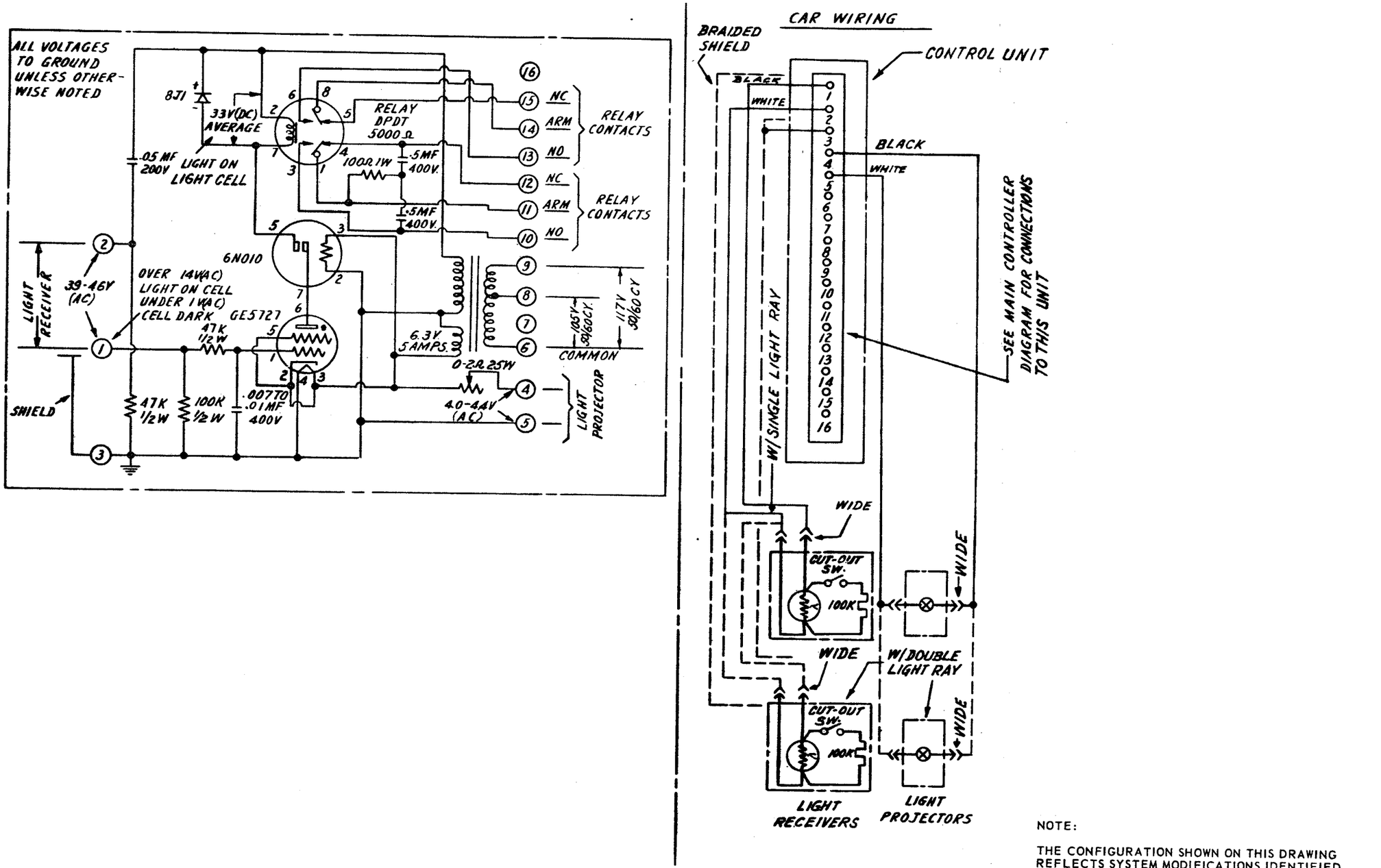




NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING 23-A4F6987H, SHEET 2.

Figure 8-55. System Wiring Diagram (Sheet 2 of 2)



NOTE:

THE CONFIGURATION SHOWN ON THIS DRAWING REFLECTS SYSTEM MODIFICATIONS IDENTIFIED FOR CHANGES TO THIS MANUAL AND MAY DIFFER FROM THE CURRENT REVISION OF OTIS DRAWING A1 S/F 6971J

Figure 8-56. Light Ray Electrical Diagram

APPENDIX A

PARTS LIST AND PRICING GUIDE

1. Quantities recommended are for one elevator for an 18-month period.

2. Unit prices are based on a minimum spare parts order of $4.00.

3. Unless otherwise indicated, parts available from:

   Otis Elevator Company
   260 Eleventh Avenue
   New York, N. Y.

   or nearest field office.

RECOMMENDED SPARE PARTS LIST

END ITEM OF EQUIPMENT
DESCRIPTION OF ITEM HIGH-BAY ELEVATORS 1-16
QUANTITY INSTALLED
M. E. L. REFERENCE DESIGNATOR
CONTRACT NUMBER DA-08-176-ENG (NASA)-61

RECOMMENDED SPARE PARTS LIST FOR 18 MONTH PERIOD

COMPLETE SPARE PART IDENTIFICATION FOR RE-ORDERING	RECOMMENDED QUANTITY PER END ITEM	UNIT PRICE	PROCUREMENT LEAD TIME (DAYS)	NAME AND ADDRESS OF SUPPLIER
ELECTRONIC AND DISPATCHING CONTROLLER 301038-351				Unless otherwise indicated, parts available from Otis Elevator Company 260 - 11th Ave. New York, New York
Condensers, 226D1	1	2.54	30	
D2	1	3.75	30	
H2	1	3.33	30	
H3	1	2.90	30	
H4	1	3.51	30	
H5	1	2.06	30	
Fuse, 375H3	3	.23	30	
H6	3	.23	30	
H10	6	.23	30	
T1	9	.36	30	
P2	1	.18	30	
Rectifier, 230AR2	1	8.96	30	
230BD4	2	3.07	30	
230AL1	1	40.96	30	
Resistor, 232B174	1	2.90	30	
B177	1	2.90	30	
Y25	1	1.27	30	
Y53	1	1.27	30	
B163	1	2.90	30	
AH3	1	6.35	30	
BA23	1	2.00	30	
BA24	1	2.00	30	
B167	1	2.90	30	
B165	1	2.90	30	
Switch, 6840J4	1	73.37	60	
A6164BP-132-CY1	1	20.57	30	
A6164BP-114-CY1	2	20.57	30	
6840J3	1	73.37	60	
A6164BP-150-CY1	1	20.57	30	
B6842G1	1	51.49	30	
A6164BP-141-CY1	1	20.57	30	

RECOMMENDED SPARE PARTS LIST

END ITEM OF EQUIPMENT
DESCRIPTION OF ITEM: HIGH-BAY ELEVATORS 1-16
QUANTITY INSTALLED:
M. E. L. REFERENCE DESIGNATOR:
CONTRACT NUMBER: DA-08-176-ENG (NASA)-61

RECOMMENDED SPARE PARTS LIST FOR 18 MONTH PERIOD

COMPLETE SPARE PART IDENTIFICATION FOR RE-ORDERING	RECOMMENDED QUANTITY PER END ITEM	UNIT PRICE	PROCUREMENT LEAD TIME (DAYS)	NAME AND ADDRESS OF SUPPLIER
ELECTRONIC AND DISPATCHING CONTROLLER, 301038-351				Unless otherwise indicated, parts available from Otis Elevator Company 260 - 11th Avenue New York, New York
Switch, 6842H2	1	19.14	60	
A6164BP-123-CY1	1	20.57	30	
B6842B3	1	43.26	30	
77D1	1	14.64	30	
A6843Y	1	38.28	60	
A6843R21	9	44.66	60	
6840P	1	54.23	60	
B6842B4	1	49.91	30	
B6840AA	1	178.64	60	
6840Y1	1	98.89	60	
B6842B2	1	46.10	30	
A6164BP-120-CY1	1	14.52	30	
A6164BP-122-CY1	1	19.36	30	
6841C2	1	35.09	90	
6141C1	9	35.09	90	
300753-377	1	38.28	90	
Transformer, 225DB1	1	59.23	90	
235G2	1	65.28	30	
225CG3	1	34.56	30	
225CJ1	1	37.12	30	
Tube (Amperite Type 115N010) Otis No. 6842D2	1	5.32	90	Amperite Co., Inc. 600 Palisade Ave., Union City, N.J.
HA GOVERNOR, 301038-308				
Spring, 90YA18	4	.30	30	
Box, 6151B1	2	17.55	60	

RECOMMENDED SPARE PARTS LIST

END ITEM OF EQUIPMENT
DESCRIPTION OF ITEM HIGH-BAY ELEVATORS 1-16
QUANTITY INSTALLED
M. E. L. REFERENCE DESIGNATOR
CONTRACT NUMBER DA-08-176-ENG (NASA)-61

RECOMMENDED SPARE PARTS LIST FOR 18 MONTH PERIOD

COMPLETE SPARE PART IDENTIFICATION FOR RE-ORDERING	RECOMMENDED QUANTITY PER END ITEM	UNIT PRICE	PROCUREMENT LEAD TIME (DAYS)	NAME AND ADDRESS OF SUPPLIER
REAR CAR DOOR INTERLOCK, 301047-355				Unless otherwise indicated, parts available from Otis Elevator Company 260- 11th Avenue New York, New York
Coil, 4-222AL	5	10.05	60	
Contact, 3-6850Y	4	23.27	60	
Spring, 90LA6	1	.35	30	
HOIST DOOR INTERLOCK 301038-813				
Switch, 6940AG1	1	17.92	30	
Switch, 6940AG2	1	17.92	30	
CAR DOOR OPERATOR 301038-800				
Contact, 6850Y Arr. 1	6	31.90	30	
Contact, 6850Y Arr. 5	5	28.71	30	
Contact, 6554B1	1	9.57	30	
Resistor, 232B	1	2.90	30	
Resistor, 232P	1	2.90	30	
Switch, 6599A3	1	1.75	30	
SECONDARY SHEAVE 301038-305				
Bearing, 209B25	1	302.50	30	
HALL LANTERNS, 301038-312 & 301047-330				
Lamp, 6599D9	196	.54	60	
HALL POSITION INDICATOR, 301038-330				
Lamp, 6599D8	49	.36	60	

RECOMMENDED SPARE PARTS LIST

END ITEM OF EQUIPMENT
DESCRIPTION OF ITEM HIGH-BAY ELEVATORS 1-16
QUANTITY INSTALLED
M. E. L. REFERENCE DESIGNATOR
CONTRACT NUMBER DA-08-176-ENG (NASA)-61

RECOMMENDED SPARE PARTS LIST FOR 18 MONTH PERIOD

COMPLETE SPARE PART IDENTIFICATION FOR RE-ORDERING	RECOMMENDED QUANTITY PER END ITEM	UNIT PRICE	PROCUREMENT LEAD TIME (DAYS)	NAME AND ADDRESS OF SUPPLIER
CAR POSITION INDICATOR 301038-340				Unless otherwise indicated, parts available from Otis Elevator Company 260 - 11th Avenue New York, New York
Lamp, 6599D8	47	.36	60	
LANDING BUTTON FIXTURE, 301038-314 & 301038-315				
Tube, 425A4	45	5.32	90	
CAR OPERATING PANELS 301038-316				
Contact, 150P4	1	.48	30	
Lamp, 424A3	5	1.21	90	
Lamp, 6599D8	2	.36	60	
Condenser, 226AA1	1	.23	30	
Condenser, 226Y4	1	2.36	30	
Resistor, 232F9	1	.20	30	
Resistor, 232Y36	1	1.27	30	
Switch, 6599A8	1	3.39	60	
Telephone Jack, 6599F2	1	15.95	60	
Tube, 425A2	94	5.32	30	
Screw, 124CJ3	5	.26	90	
269HT MACHINE - 301038-300				
Bearing, (SKF22232C)	1	265.35	90	(SKF Industries (Front St. & Erie Ave.
Bearing (SKF 22338C)	1	689.40	90	(Philadelphia 32, Pa.
Brake Lining, 416AF1	2	13.01	30	
Gasket, 1-376EE1	1	.96	60	
Gasket, 4-376H1	1	2.07	30	
Gasket, 4-376H2	1	2.39	30	
Pole Piece, 1-355AL1	4	293.48	60	
Rivets, 145C6	48	.03	30	
Spring, 1-90TD3	1	18.73	30	
Spring, 2-93DH1	1	17.30	30	

RECOMMENDED SPARE PARTS LIST

END ITEM OF EQUIPMENT
DESCRIPTION OF ITEM: HIGH-BAY ELEVATORS 1-16
QUANTITY INSTALLED:
M. E. L. REFERENCE DESIGNATOR:
CONTRACT NUMBER: DA-08-176-ENG (NASA)-61

RECOMMENDED SPARE PARTS LIST FOR 18 MONTH PERIOD

COMPLETE SPARE PART IDENTIFICATION FOR RE-ORDERING	RECOMMENDED QUANTITY PER END ITEM	UNIT PRICE	PROCUREMENT LEAD TIME (DAYS)	NAME AND ADDRESS OF SUPPLIER
269HT MACHINE 301038-300 - (Cont'd.)				Unless otherwise indicated, parts available from Otis Elevator Company 260 - 11th Avenue New York, New York
Spring, 30KC2	1	.70	30	
5B M.G. SET WITH 30AC MOTOR & 73GX EXCITER, 301038-307				
Sleeve, 166687	1	185.02	30	
Holder, 6134A1	16	9.57	60	
Brush, 1-6134C	4	7.65	60	
Ring, 174342	1	2.55	45	
Ring, 174343	1	3.19	45	
73UAL CONTROLLER 301038-350				
Condensers, 226D1	1	2.54	30	
226D2	1	3.75	30	
226D3	1	3.33	30	
226H1	1	2.12	30	
226H2	2	2.72	30	
226H3	1	2.90	30	
226H4	2	3.51	30	
226H5	1	2.06	30	
226H6	1	2.84	30	
226W1	1	8.65	30	
226W2	1	9.44	30	
Fuse, 375J10	9	.96	30	
375H10	12	.23	30	
375H3	12	.23	30	
375H60	6	.74	30	
375H1	6	.23	30	
375P1	15	.18	30	
375T1	9	.36	30	

RECOMMENDED SPARE PARTS LIST

END ITEM OF EQUIPMENT
DESCRIPTION OF ITEM HIGH-BAY ELEVATORS 1-16
QUANTITY INSTALLED
M. E. L. REFERENCE DESIGNATOR
CONTRACT NUMBER DA-08-176-ENG (NASA)-61

RECOMMENDED SPARE PARTS LIST FOR 18 MONTH PERIOD

COMPLETE SPARE PART IDENTIFICATION FOR RE-ORDERING	RECOMMENDED QUANTITY PER END ITEM	UNIT PRICE	PROCUREMENT LEAD TIME (DAYS)	NAME AND ADDRESS OF SUPPLIER
73UAL CONTROLLER - 301038-350 - (Cont'd.)				Unless otherwise indicated, parts available from Otis Elevator Company 260 - 11th Avenue New York, New York
Fuse, 375P6	6	.18	30	
375P3	6	.18	30	
375P4	6	.18	30	
Resistor, 232AA4	1	8.65	30	
232E44	1	6.66	30	
232E30	1	6.66	30	
232E25	1	6.66	30	
232B171	1	2.90	30	
232B177	1	2.90	30	
232B176	1	2.90	30	
232B220	2	2.42	30	
232B170	1	2.90	30	
232B172	1	2.90	30	
232E47	1	6.66	30	
232E42	1	6.66	30	
232E31	1	6.66	30	
232B167	1	2.90	30	
232E39	1	6.66	30	
232E164	1	6.11	30	
232B169	1	2.90	30	
232AA32	1	9.68	30	
232AA34	1	9.68	30	
232AA36	1	9.68	30	
232AA38	1	9.68	30	
232E7	1	5.87	30	
232E129	1	5.87	30	
232E33	1	6.66	30	
232E9	1	5.87	30	
232E45	1	6.66	30	
232E134	1	5.87	30	
232E155	1	6.11	30	
232E5	1	5.87	30	
232E125	1	5.87	30	
232E151	1	6.11	30	
232E190	1	7.68	30	

RECOMMENDED SPARE PARTS LIST

END ITEM OF EQUIPMENT
DESCRIPTION OF ITEM HIGH-BAY ELEVATORS 1-16
QUANTITY INSTALLED
M. E. L. REFERENCE DESIGNATOR
CONTRACT NUMBER DA-08-176-ENG (NASA)-61

RECOMMENDED SPARE PARTS LIST FOR 18 MONTH PERIOD

COMPLETE SPARE PART IDENTIFICATION FOR RE-ORDERING	RECOMMENDED QUANTITY PER END ITEM	UNIT PRICE	PROCUREMENT LEAD TIME (DAYS)	NAME AND ADDRESS OF SUPPLIER
73UAL CONTROLLER 301038-350 - (Cont'd.)				Unless otherwise indicated, parts available from Otis Elevator Company 260 11th Avenue New York, New York
Resistor, 232E18	1	5.87	30	
232E191	1	7.68	30	
232E27	1	6.66	30	
232AA48	1	10.35	30	
232AA3	1	8.65	30	
232AA15	1	9.98	30	
232AA35	1	9.68	30	
232AA17	1	9.98	30	
232AA18	1	9.98	30	
232AA33	1	9.68	30	
232AA37	1	9.68	30	
232AA46	1	10.35	30	
232AA12	1	9.98	30	
232AA16	1	9.98	30	
232AH1	1	6.35	30	
232AH3	1	6.35	30	
232B165	1	2.90	30	
232BA28	1	2.00	30	
232Y31	1	1.27	30	
232Y42	1	1.27	30	
232Y56	1	1.27	30	
Rectifiers, 230AJ1	1	99.83	30	
230AL1	1	39.93	30	
230AR1	16	7.68	30	
230AZ1	1	11.98	30	
Reactor, A7011A Arr. 2	1	191.41	60	
Relay, 6842J	1	22.33	30	
Relay, 6315J	1	39.39	30	
Switch, 177E1	1	7.32	30	
Switch, A6164BP-332-CX1	1	43.52	60	
132-CX2	1	43.52	30	
122-CY1	1	40.96	30	
123-CY1	2	43.52	30	
131-CY1	1	40.96	30	
114-CY1	1	43.52	30	

RECOMMENDED SPARE PARTS LIST

END ITEM OF EQUIPMENT
DESCRIPTION OF ITEM HIGH-BAY ELEVATORS 1-16
QUANTITY INSTALLED
M. E. L. REFERENCE DESIGNATOR
CONTRACT NUMBER DA-08-176-ENG (NASA)-61

RECOMMENDED SPARE PARTS LIST FOR 18 MONTH PERIOD

COMPLETE SPARE PART IDENTIFICATION FOR RE-ORDERING	RECOMMENDED QUANTITY PER END ITEM	UNIT PRICE	PROCUREMENT LEAD TIME (DAYS)	NAME AND ADDRESS OF SUPPLIER
73UAL CONTROLLER - 301038-350 - (Cont'd.)				Unless otherwise indicated, parts available from
Switch, A6164BP-132-CY1	5	43.52	30	Otis Elevator Company
140-CY1	1	40.96	30	260 11th Avenue
141-CY1	2	43.52	30	New York, New York
150-CY1	1	43.52	30	
114-CY2	1	43.52	30	
132-CY2	1	43.52	30	
141-CY2	1	43.52	30	
623-CZ2	1	43.52	60	
650-CZ2	1	43.52	30	
741-CZ2	1	43.52	30	
323-CZ3	1	43.52	30	
623-CZ5	1	43.52	30	
411-222DS1	1	30.72	60	
411-222DS5	1	30.72	30	
B6754A-122-CD1	2	66.56	30	
726-CD1	1	102.40	30	
122-CD2	1	66.56	30	
122-CD3	1	66.56	30	
122-CD4	1	66.56	30	
125-CD4	1	84.48	30	
B6754C-125-CD2	1	84.48	30	
162-CD2	1	66.56	30	
165-CD2	1	84.48	30	
162-CD3	1	66.56	30	
A6754D-100-CD2	1	51.20	30	
6754Y-160-CD3	1	81.92	30	
A6830B-744-CV1	1	107.52	30	
Transformer, 235A2	1	141.09	90	
225DR1	1	33.75	90	
235G2	1	71.87	30	
6850BJ SELECTORS - 301038-347 &-348				
Bearing, 207Z3	2	1.74	30	
207Z44	2	2.54	30	
213D2	2	4.31	30	

RECOMMENDED SPARE PARTS LIST

END ITEM OF EQUIPMENT
DESCRIPTION OF ITEM HIGH-BAY ELEVATORS 1-16
QUANTITY INSTALLED
M. E. L. REFERENCE DESIGNATOR
CONTRACT NUMBER DA-08-176-ENG (NASA)-61

RECOMMENDED SPARE PARTS LIST FOR 18 MONTH PERIOD

COMPLETE SPARE PART IDENTIFICATION FOR RE-ORDERING	RECOMMENDED QUANTITY PER END ITEM	UNIT PRICE	PROCUREMENT LEAD TIME (DAYS)	NAME AND ADDRESS OF SUPPLIER
6850BJ SELECTORS - 301038-347 & -348				Unless otherwise indicated, parts available from Otis Elevator Company 260 11th Avenue New York, New York
Cam Assy, 6827C1	20	9.25	30	
Contact Assy., 172JN2	2	9.57	30	
Spring, 90YA13	2	.30	30	
90HB9	2	.30	30	
90VA7	2	.25	30	
Switch, 6599A3	2	1.75	30	
6104AS	2	9.57	30	
6850CH	2	20.74	30	

NOTE: MIN SPARE PARTS ORDER FOUR DOLLARS

APPENDIX B

TEST PROCEDURES AND RESULTS

Form [illegible] PRINTED IN U.S.A.

ELECTRIC ELEVATOR FIELD TEST AND DATA REPORT

Car #5

(Send One Copy To General Construction Manager's Office)

1. Name Vertical Assembly Building Contract No. 301039 Date 2-5-66

2. Location MILA (City) Florida (State)

3. Duty 8000 (lbs.) @ 700 (fpm) Pass. [X] Frt. [ ] Ser. [ ] SW [ ] DW [ ]

4. Confirmed Power DC [ ] AC [X] 480 (volts) 3 (phase) 60 (freq.) 4 (wires)

5. Mach. 269HT (size) Sheave 36 (diam.)" U (groove)° Located OH [X] Below [ ] Side [ ] Shipped (date)

6. Operation: C.S. [ ] D.B. [ ] P.B. [ ] Coll. P.B. [ ] S.C. [ ] U.A.L. [X] Other (name) U.M.V. [X] Resist. [ ]

7. Ropes 8 (no.) 5/8 (size) Roping 1:1 [ ] 2:1 [ ] or (denote) Rope Mfr.

8. Compensation 6-5/8" Rope (size and no.) Tied Down Type Car Safety Cwt.

9. Rise 419' 9" No. Stops 20 No. Openings 21 Specified Counterbalance 42.5 %

10. Door Opening 60" (width) 1 Sp.S.O. 2 Sp. S.O. X (check type of doors) C.O. Hangers (type) AU Rubb (car) 7060 (hoistway)

11. Door Operator 6970A (type) Door Detector S.S. & Light Ray (type) Otis Service (type) (start date)

---

12. Counterbalance Test: Crank [ ] D.C. Ammeter [X] Tachometer [X] Other [ ] (explain)

13. Bal. Load 3400 (lbs.) Subwts. 31/13 (no.) @ 373/297 (approx. ¼ lb./cu.") Lbs.

14. To Correct Counterweighing 2 (number) Sub Weights were (Added) (Removed) (cross out one) No. Bal. Weights Added {Car 500# / Cwt. 0

15. Car Safety Test: Hand [ ] Runaway [X] Load in Car? 8000 (lbs.) Car Set Level? Yes (within ¼" per foot of d. b. g.) Slide 6 & 0" (rail marking)

CWT. Safety Test: Hand [ ] Runaway [ ] Load in Car? — — — (lbs.) CWT. Slide — — + — — —"

Pot. Sw. Slowdown Hoistway Sw. Set Do. —'—" From Top Fl.—Up From Bott. Fl. —'—" If on Sel. Ck. [ ]

Speed Pot: Sw. Slowdown Contact Closes: Up — — — (f. p. m.) Do. — — — (f. p. m.) On Gov. [ ] Plug. Sw. Sel. [ ] (check one)

16. Governor Tripping Speed 840 (f. p. m.) How Checked? Over SPD Contact 795 (pot) (f. p. m.) Contact 755 (field) (f. p. m.)

17. O.H. Car 113" Pit Cwt. 15" Up Limit Opens 12"

18. O.H. Cwt. 108" Pit Car 11" Do. Limit Opens 10½"

19. Pit Depth 145" Final Limits Through Bolted [X] O.H. Car to Nearest Striking Point 107"

20. Buffers: Car Type Oil Stroke 33½" Cwt. Type Oil Stroke 33½"

21. Car Statically Balanced % Load 0 { Top Hoistway [ ] / Center Hoistway [X] / Bottom Hoistway [ ] } Roller Guides Adjusted [X]

22. Power Oper. Doors X A.S.A. Code Door Close Time 4.3 Secs. Door Speed 1' of Fast Speed 1 Secs.

Door Close Time (Otis Card) 5 Secs. Lbs. Thrust Close 24 Door Open Time 3 Secs.

Time Before Nudging 20 Secs. Door Close Time in Nudging 6.8 Secs.

23. Worm Gear Bearing Contacts: Cross Corner [ ] Central [ ]

24. Brake Set 125% Load A.C. Yes Per Brake Load Chart D.C. — — — Lbs. in Car 10,000

25. Worm Thrust Clearance — — —" Backlash — — — Secondary Gear Contact — — — Clearance — — —"

26. Any Objectional Noise? None Any Objectional Heating? None (explain)

(Over)

27. Elev. Motor Serial No. 303403 — 269HT (size) — 355 (amps.) — 315 (n.l. volts) — ____ (f.l. volts) — 74/65 (rpm) — 130 (hp)

28. Motor Generator: 5 BMG (size) — 1200 (rpm) — 70 (gen. kw.) — 315 (gen. volts) — 222 (gen. amps.)

Gen. Driving Motor 30AC (size) — 110 (hp) — 480 (volts) — 130 (amps. per line) — 50° C (temperature rise)

Exciter 73GX (type) — 1200 (rpm) — 7.5 (kw.)

29. Commutation: GOOD (elev. motor) — GOOD (gen.) — ____ (d. c. gen. motor) — GOOD (exciter)

30. Controller 73 UAL (type) Serial No. 219560 W/D No. 23-A4S6987H

Damping-Condensers Total Used MFDS. 6400 Res. Value 0 Condensers in Brake Timing MFDS. 1600

31. Overload Relays Checked, Controller and Starter: 1P 10 2P 12 3P 23 (time in seconds); 3P 420 (amps.)

32. Actual Line Voltage (At P. H. Switch) 480 (start) — 480 (idle) — 480 (full speed)

33. Main Fuses or Circuit Breaker Setting 200 (amps.) Rectifier or Exciter Voltage 124 (idle) — 120 (full load)

34. Car Speed, Elevator Motor Current, and Voltage Values:

NOTE: The values for Items 34 thru 38 should be obtained with CORRECT counterbalance.

Speed for all Elevators—All Ammeter Readings for U. M. V. and D. C.—Full Load Reading Only for A. C.—Indicate Negative Readings with Minus Sign.)

Actual Weight In Car	Car #5	Car Speed F. P. M.	Amperes Start	Amperes Run	Amperes Stop	Volts Run	Micro Slow-Speed F.P.M.
0 #	No Load Up	698	110	-160	-440	273	
0 #	No Load Do.	700	500	220	-100	285	
3400 #	Balance Load Up	690	300	18	-290	290	21
3400 #	Balance Load Do.	690	300	18	-290	290	21
8000 #	Full Load Up	690	520	260	-100	310	
8000 #	Full Load Do. (Field Switch Out)	690	120	-190	-530	783	
8000 #	Full Load Do. (Field Switch In)	620	120	-170	-480	283	

41. Volts

Car Button
CBo to CB +..128
CBo to CTB..-29
CBo to HL1..170
CBo to AC1..108

Hall Button
Bo to B +..140
Bo to B -..40
Bo to HL1..183
Bo to AC1..108

35. Car Speed Bal. Load Full Field 618 Arm. Volts Bal. Load Full Field 285

Elev. Motor Field Voltage 33 (idling) 82 (full speed) 119 (leveling) Norm. Circ. Current 10 (amps.) No. Turns Series Fld. 6

36. Loop Cir. Drop-hold Brake Current Rise Approach 0 Relevel 0

Compounding Spread No Load HSL or TL (cross out one) Speed 17 (f.p.m.) Up 112 Do 95

Feed Back Ratio HSL HX Speed 2:1 Comp. Spread No Load 10U to 70U 17 (accel.) 17 (stop) 17 (lev.)

37. Loop Cir. Amps. Current Stall Condition: LFR (Full) 150 1RL 300 2RL 420 3RL ____

38. Flight Time (Start to Stop) Bal. Load 1 Floor (in secs.) 4.5 (up) 4.5 (down) Fl. Height 12'8" } For Car Speeds 200 F. P. M. and Over. Brake to Brake

Flight Time (Start to Stop) No Load 1 Floor 4.6 (up) — 4.5 (down) Fl. Height 12'8" }

39. Has Geared Machine Been Lined By Head Method? ☐

40. Gov. Seal Nos. 003878, 003898

42. Remarks

Sup't Mr. C. P. Ryan

Inspected by: MKPH

Inspector's Name R. D. Kulchak

In Service (date)

Erector Mr. B. R. Ritchie

Adjuster Mr. R. L. Propes

Approved by (Field Engineer)

Zone ATLANTA

(Please Do Not Submit Incomplete Reports to Headquarters)

Form 992A (5-63)
PRINTED IN U.S.A.

ELECTRIC ELEVATOR FIELD TEST AND DATA REPORT

Car #9

(Send One Copy To General Construction Manager's Office)

1. Name VAB Contract No. 301040 Date 9 — 65

2. Location Mila (City) Florida (State)

3. Duty 8000 (lbs.) @ 700 (fpm) Pass. [X] Frt. [ ] Ser. [ ] SW [ ] DW [ ]

4. Confirmed Power DC [ ] AC [ ] 480 (volts) 3 (phase) 60 (freq.) 4 (wires)

5. Mach 269 Ht. (in.) Sheave 30 (diam.)" Round (groove)° Located OH [X] Below [ ] Side [ ] Shipped (date)

6. Operation: C.S. [ ] D.B. [ ] P.B. [ ] Coll. P.B. [ ] S.C. [ ] U.A.L. [X] Other (name) U.M.V. [X] Resist. [ ]

7. Ropes 8 (no.) 5/8 (size) Roping 1:1 [X] 2:1 [ ] or (denote) Rope Mfr.

8. Compensation 5/8 — 5 (size and no.) Tied Down No Type Car Safety Special (d) Cwt.

9. Rise 419 ' 9 " No. Stops 28 No. Openings 28 Specified Counterbalance 42.5 %

10. Door Opening 60 (width)" 1 Sp.S.O. 2 Sp. S.O. x (check type of doors) C.O. Hangers (type) AU (car) 7060 (hoistway)

11. Door Operator 6970 (type) Door Detector Photo - bell (type) Otis Service (type) (start date)

---

12. Counterbalance Test: Crank [ ] D.C. Ammeter [X] Tachometer [ ] Other [ ] (explain)

13. Bal. Load 3400# (lbs.) Subwts. 31 (no.) -13 @ 369 (approx. ¼ lb./cu.") 276 Lbs.

14. To Correct Counterweighing 2 (number) Sub Weights were (Added) (Removed) (cross out one) No. Bal. Weights Added {Car 0 / Cwt. 0}

15. Car Safety Test: Hand [ ] Runaway [X] Load in Car? 8000 (lbs.) Car Set Level? yes (within ¼" per foot ~~yes~~ b. g.) Slide 4 ' 8" (rail marking)

CWT. Safety Test: Hand [ ] Runaway [ ] Load in Car? (lbs.) CWT. Slide ' "

Pot. Sw. Slowdown Hoistway Sw. Set Do. ' " From Top Fl.—Up From Bott. Fl. ' " If on Sel. Ck. [ ]

Speed Pot. Sw. Slowdown Contact Closes: Up (f. p. m.) Do. (f. p. m.) On Gov. [ ] Plug. Sw. Sel. [ ] (check one)

16. Governor Tripping Speed 850 (f. p. m.) How Checked? Overspeed to Contact 810 (pot) (f. p. m.) Contact 740 (field) (f. p. m.)

17. O.H. Car 10' 2" " Pit Cwt. 9" " Up Limit Opens 12" "

18. O.H. Cwt. 10' 6" " Pit Car 12" " Do. Limit Opens 10" "

19. Pit Depth 12' 1" " Final Limits Through Bolted [X] O.H. Car to Nearest Striking Point 10' 6"

20. Buffers: Car Type oil Stroke 33½ " Cwt. Type oil Stroke 33½ "

21. Car Statically Balanced % Load { Top Hoistway [X] / Center Hoistway [X] / Bottom Hoistway [X] } Roller Guides Adjusted [X]

22. Power Oper. Doors yes A.S.A. Code Door Close Time 4 Secs. Door Speed 1' of Fast Speed 1 Secs.

Door Close Time (Otis Card) 5 Secs. Lbs. Thrust Close 24 Door Open Time 4.5 Secs.

Time Before Nudging 15 Secs. Door Close Time in Nudging 8 Secs.

23. Worm Gear Bearing Contacts: Cross Corner [ ] Central [ ]

24. Brake Set 125% Load A.C. Per Brake Load Chart D.C. yes Lbs. in Car 10,000

25. Worm Thrust Clearance " Backlash Secondary Gear Contact Clearance "

26. Any Objectional Noise? No Any Objectional Heating? No (explain)

(Over)

27. Elev. Motor Serial No. 303404 ..... 269 (size) Ht 355 (amps.) 315 ~~355~~ (n.l. volts) ~~315~~ (f.l. volts) 74/43 (rpm) 130 (hp)

28. Motor Generator: 5 ~~B4~~ 6 (size) 1200 (rpm) 70 (gen. kw.) 315 (gen. volts) 222 (gen. amps.)

Gen. Driving Motor 30 (size) AC 110 (hp) 480 (volts) 130 (amps. per line) 50 (temperature rise)

Exciter 736 X (type) 1200 (rpm) 7.0 (kw.)

29. Commutation Good (elev. motor) Good (gen.) (d. c. gen. motor) Good (exciter)

30. Controller 83 UAL (type) Serial No. 219561 W/D No. 23 - A4 56987 H

Damping-Condensers Total Used MFDS 3200 Res. Value 30 Condensers in Brake Timing MFDS 1600

31. Overload Relays Checked, Controller and Starter: 1P 18 2P 22 (time in seconds) 3P 12 ; 3P 650 (amps.)

32. Actual Line Voltage (At P. H. Switch) 480 (start) 484 (idle) 480 (full speed)

33. Main Fuses or Circuit Breaker Setting 200 (amps.) Rectifier or Exciter Voltage 122 (idle) 128 126 (full load) 126

34. Car Speed, Elevator Motor Current, and Voltage Values:

NOTE: The values for Items 34 thru 38 should be obtained with CORRECT counterbalance.

Speed for all Elevators—All Ammeter Readings for U. M. V. and D. C.—Full Load Reading Only for A. C.—Indicate Negative Readings with Minus Sign.)

Actual Weight In Car	Car #9	Car Speed F. P. M.	Amperes Start	Amperes Run	Amperes Stop	Volts Run	Micro Slow-Speed F.P.M.
0 #	No Load Up	685	185	-145	-415	275	
0 #	No Load Do.	685	515	200	-100	280	
3400 #	Balance Load Up	690	340	20	-330	280	20
3400 #	Balance Load Do.	690	340	18	330	280	20
8000 #	Full Load Up	680	600	300	-120	285	
8000 #	Full Load Do. (Field Switch Out)	700	180	220	-580	270	
8000 #	Full Load Do. (Field Switch In)	580	180	190	-480	260	

41. Volts

Car Button

CBo to CB +135

CBo to CTB 35

CBo to HL1 150

CBo to AC1 100

Hall Button

Bo to B +138

Bo to B -35

Bo to HL1 70

Bo to AC1 105

35. Car Speed Bal. Load Full Field 580 Arm. Volts Bal. Load Full Field 280

Elev. Motor Field Voltage 30 (idling) 75 (full speed) 122 (leveling) Norm. Circ. Current 8 (amps.) No. Turns Series Fld. 12

36. Loop Cir. Drop-hold Brake Current Rise Approach 0 Relevel 0

Compounding Spread No Load HSL or TL (cross out one) Speed 17 (f.p.m.) Up 101 Do. 84

Feed Back Ratio HSL Speed 2:1 Comp. Spread No Load 10U to 70U (accel.) (stop) (lev.)

37. Loop Cir. Amps. Current Stall Condition: LFR (Full) 8 FPM 1RL 18 FPM 2RL 28 FPM 3RL

38. Flight Time (Start to Stop) (in secs.) Bal. Load 1 Floor 4.6 (up) 4.6 (down) Fl. Height 12' 8" } For Car Speeds 200 F. P. M. and Over. Brake to Brake

Flight Time (Start to Stop) No Load 1 Floor 4.7 (up) 4.8 (down) Fl. Height 12' 8" }

39. Has Geared Machine Been Lined By Head Method? ☐

40. Gov. Seal Nos. Gy 714 Gy 723

42. Remarks

Sup't Mr. Pope

Erector Mr. Ritchie

Inspected by: City [ ] State [ ] Gov't [ ]

Adjuster Mr. Branch - - Squires

Inspector's Name

Approved by (Field Engineer)

In Service (date)

Zone At.

(Please Do Not Submit Incomplete Reports to Headquarters)

Form 992A (5-63)
PRINTED IN U.S.A.

ELECTRIC ELEVATOR FIELD TEST AND DATA REPORT

Car #10

(Send One Copy To General Construction Manager's Office)

1. Name VAB Contract No. 301041 Date 10 - - 65

2. Location Villa (City) Florida (State)

3. Duty 8000 (lbs.) @ 700 (fpm) Pass. [X] Frt. [ ] Ser. [ ] SW [ ] DW [ ]

4. Confirmed Power DC [ ] AC [X] 480 (volts) 3 (phase) 60 (freq.) 4 (wires)

5. Mach. 269 HT (size) Sheave 30 (diam.)" Round (groove)° Located OH [X] Below [ ] Side [ ] Shipped (date)

6. Operation: C.S. [ ] D.B. [ ] P.B. [ ] Coll. P.B. [ ] S.C. [ ] U.A.L. [X] Other (name) U.M.V. [X] Resist. [ ]

7. Ropes 8 (no.) 5/8 (size) Roping 1:1 [X] 2:1 [ ] or (denote) Rope Mfr.

8. Compensation 5/8 - 5 (size and no.) Tied Down No Type Car Safety Special (d) Cwt.

9. Rise 419 ' 9 " No. Stops 28 No. Openings 28 Specified Counterbalance 42.5 %

10. Door Opening 60 (width)" 1 Sp.S.O. 2 Sp. S.O. X (check type of doors) C.O. Hangers (type) AU (car) 7060 (hoistway)

11. Door Operator 6970 A (type) Door Detector s/s - photo - bell (type) Otis Service (type) (start date)

---

12. Counterbalance Test: Crank [ ] D.C. Ammeter [X] Tachometer [X] Other [ ] (explain)

13. Bal. Load 3400 (lbs.) Subwts. 31 (no.) @ 369 (approx. ¼ lb./cu.") Lbs.
~~13~~ 276

14. To Correct Counterweighing 2 (number) Sub Weights were (Added) (Removed) (cross out one) No. Bal. Weights Added {Car 0 / Cwt. 6}

15. Car Safety Test: Hand [ ] Runaway [X] Load in Car? 8000 (lbs.) Car Set Level? Yes (within ¼" per foot of d. b. g.) Slide 8 ' 7 " (rail marking)

Hand [ ] Runaway [ ] Load in Car? (lbs.) CWT. Slide ' "

Do. ' "-From Top Fl.—Up From Bott. Fl. ' " If on Sel. Ck. [ ]

Closes: Up (f. p. m.) Do. (f. p. m.) On Gov. [ ] Plug. Sw. Sel. [ ] (check one)

16. Governor Tripping Speed 850 m. How Checked? Overspeed tec. Contact 810 (not) (f. p. m.) Contact 740 (field) (f. p. m.)

17. O.H. Car 121 " Pit Cwt. 20 " Up Limit Opens 12 "

18. O.H. Cwt. 100 " Pit Car 12 " Do. Limit Opens 12 "

19. Pit Depth 145 " Final Limits Through Bolted [X] O.H. Car to Nearest Striking Point 104 "

20. Buffers: Car Type oil Stroke 33½ " Cwt. Type oil Stroke 33½ "

21. Car Statically Balanced % Load 0 { Top Hoistway [X] / Center Hoistway [X] / Bottom Hoistway [X] } Roller Guides Adjusted [X]

22. Power Oper. Doors Yes A.S.A. Code Door Close Time 4 Secs. Door Speed 1' of Fast Speed 1 Secs.

Door Close Time (Otis Card) 5.4 Secs. Lbs. Thrust Close 24 Door Open Time 3.5 Secs.

Time Before Nudging 15 Secs. Door Close Time in Nudging 8 Secs.

23. XX Worm Gear Bearing Contacts: Cross Corner [ ] Central [ ]

24. Brake Set 125% Load A.C. Per Brake Load Chart D.C. yes Lbs. in Car 10,000

25. XX Worm Thrust Clearance " Backlash Secondary Gear Contact Clearance "

26. Any Objectional Noise? No Any Objectional Heating? No (explain)

(Over)

27. Elev. Motor Serial No. 303494 — 269 HT (size) — 355 (amps.) — 315 (n.l. volts) — — (f.l. volts) — 74/63 (rpm) — 130 (hp)

28. Motor Generator: 5 BM6 (size) — 1200 (rpm) — 70 (gen. kw.) — 315 (gen. volts) — 222 (gen. amps.)

Gen. Driving Motor 30 AC (size) — 110 (hp) — 480 (volts) — 130 (amps. per line) — 50 (temperature rise)

Exciter 73 6X (type) — 1200 (rpm) — 7.5 (kw.)

29. Commutation: Good (elev. motor) — Good (gen.) — — (d. c. motor) — Good (exciter)

30. Controller 73 UAL (type) Serial No. 219562 FBR W/D No. 23-A456987 H

Damping-Condensers Total Used MFDS. 0 Res. Value 30 Condensers in Brake Timing MFDS. 4800

31. Overload Relays Checked, Controller and Starter: 1P 19 — 2P 22 (time in seconds) — 3P 15; 3P 560 (amps.)

32. Actual Line Voltage (At P. H. Switch): 455 (start) — 460 (idle) — 455 (full speed)

33. Main Fuses or Circuit Breaker Setting 200 (amps.) Rectifier or Exciter Voltage 130 (idle) — 120 (full load) 128

34. Car Speed, Elevator Motor Current, and Voltage Values:

NOTE: The values for Items 34 thru 38 should be obtained with CORRECT counterbalance.

Speed for all Elevators—All Ammeter Readings for U. M. V. and D. C.—Full Load Reading Only for A. C.—Indicate Negative Readings with Minus Sign.)

Actual Weight In Car	Car #10	Car Speed F. P. M.	Amperes Start	Amperes Run	Amperes Stop	Volts Run	Micro Slow-Speed F.P.M.
0 #	No Load Up	685	280	-140	-385	273	
0 #	No Load Do.	680	425	200	-85	286	
3406 #	Balance Load Up	690	360	25	-305	285	22
3400 #	Balance Load Do.	690	360	25	-305	285	22
8000 #	Full Load Up	700	600	295	-145	295	
8000 #	Full Load Do. (Field Switch Out)	695	135	-220	620	280	
8000 #	Full Load Do. (Field Switch In)	610	135	-205	-585	278	

41. Volts

Car Button
CBo to CB + 135
CBo to CTB 35
CBo to HL1 160
CBo to AC1 100

Hall Button
Bo to B + 138
Bo to B − 35
Bo to HL1 70
Bo to AC1 100

35. Car Speed Bal. Load Full Field 595 Arm. Volts Bal. Load Full Field 285

Elev. Motor Field Voltage 28 (idling) 80 (full speed) 115 (leveling) Norm. Circ. Current 8 (amps.) No. Turns Series Fld. 12

36. Loop Cir. Drop-hold Brake Current Rise Approach 0 Relevel 0

Compounding Spread No Load ~~HSXXXXXXK~~ HX (cross out one) Speed 17 (f.p.m.) Up 101 Do. 84

Feed Back Ratio HSL Speed 2:1 Comp. Spread No Load 10U to 70U (accel.) (stop) (lev.)

37. Loop Cir. Amps. Current Stall Condition: LFR (Full) 8 FM 1RL 16 FPM 2RL 24 FPM 3RL

38. Flight Time (Start to Stop) Bal. Load 1 Floor 4.6 (in secs.) 4.6 (up) 4.6 (down) Fl. Height 12' 8" } For Car Speeds 200 F. P. M. and Over. Brake to Brake

Flight Time (Start to Stop) No Load 1 Floor 4.6 (up) 4.7 (down) Fl. Height 12' 8" }

39. Has Geared Machine Been Lined By Head Method? ☐

40. Gov. Seal Nos. CY 725 CY 702

42. Remarks

Sup't Mr. Pope — Erector Mr. Ritchie

Inspected by: City [ ] State [ ] Gov't [ ] — Adjuster Mr. Squires - Branch

Inspector's Name — Approved by (Field Engineer)

In Service (date) — Zone At.

(Please Do Not Submit Incomplete Reports to Headquarters)

Form 992A (5-63) PRINTED IN U.S.A.

ELECTRIC ELEVATOR FIELD TEST AND DATA REPORT

Car #11

(Send One Copy To General Construction Manager's Office)

1. Name VAB Contract No. 301042 Date 9--65

2. Location Merritt Island (City) Florida (State)

3. Duty 8,000 (lbs.) @ 700 (fpm) Pass. [X] Frt. [ ] Ser. [ ] SW [ ] DW [ ]

4. Confirmed Power DC [ ] AC [X] 480 (volts) 3 (phase) 60 (freq.) 4 (wires)

5. Mach. 269 ht (size) Sheave 36 (diam.)" Round (groove)° Located OH [X] Below [ ] Side [ ] Shipped (date)

6. Operation: C.S. [ ] D.B. [ ] P.B. [ ] Coll. P.B. [ ] S.C. [ ] U.A.L. [X] Other (name) U.M.V. [X] Resist. [ ]

7. Ropes 8 (no.) 5/8 (size) Roping 1:1 [X] 2:1 [ ] or (denote) Rope Mfr.

8. Compensation 5/8" 6 (size and no.) Tied Down No Type Car Safety Special (d) Cwt.

9. Rise 419 ' 9" No. Stops 33 No. Openings 33 Specified Counterbalance 42.5 %

10. Door Opening 60 (width)" 1 Sp.S.O. 2 Sp. S.O. x (check type of doors) C.O. Hangers (type) AU (car) 7060 (hoistway)

11. Door Operator 6970 A (type) Door Detector s/s/ photo (type) - bell Otis Service (type) (start date)

---

12. Counterbalance Test: Crank [ ] D.C. Ammeter [X] Tachometer [ ] Other [ ] (explain)

13. Bal. Load 3400 (lbs.) Subwts. 13 (no.) @ 276 (approx. ¼ lb./cu.") Lbs.

14. To Correct Counterweighing 2 (number) Sub Weights were (Added) (~~Removed~~) (cross out one) No. Bal. Weights Added {Car. 0 / Cwt. 0

15. Car Safety Test: Hand [ ] Runaway [X] Load in Car? 8000 (lbs.) Car Set Level? yes (within ¼" per foot of d. b. g.) Slide 5 ' 10" (rail marking)

~~CWT.~~ Safety Test: Hand [ ] Runaway [ ] Load in Car? (lbs.) CWT. Slide ' "

~~Pot Sw.~~ Slowdown Hoistway Sw. Set Do. ' " From Top Fl.—Up From Bott. Fl. ' " If on Sel. Ck. [ ]

~~Speed Pot. Sw.~~ Slowdown Contact Closes: Up (f. p. m.) Do. (f. p. m.) On Gov. [ ] Plug. Sw. Sel. [ ] (check one)

16. Governor Tripping Speed 850 (f. p. m.) How Checked? Overspeed tac. Contact (pot) 810 (f. p. m.) Contact (field) 735 (f. p. m.)

17. O.H. Car 121½" Pit Cwt. 20" Up Limit Opens. 12"

18. O.H. Cwt 100" Pit Car 12" Do. Limit Opens 12"

19. Pit Depth 144" Final Limits Through Bolted [X] O.H. Car to Nearest Striking Point 104½"

20. Buffers: Car Type oil Stroke 33½" Cwt. Type oil Stroke 33½"

21. Car Statically Balanced % Load { Top Hoistway [X] / Center Hoistway [X] / Bottom Hoistway [X] } Roller Guides Adjusted [X]

22. Power Oper. Doors A.S.A. Code Door Close Time 4.2 Secs. Door Speed 1' of Fast Speed 1 Secs.

Door Close Time (Otis Card) 5.2 Secs. Lbs. Thrust Close 24 Door Open Time 3.5 Secs.

Time Before Nudging 7.5 Secs. Door Close Time in Nudging 9 Secs.

23. Worm Gear Bearing Contacts: Cross Corner [ ] Central [ ]

24. Brake Set 125% Load A.C. Per Brake Load Chart D.C. yes Lbs. in Car. 10,000

25. Worm Thrust Clearance " Backlash Secondary Gear Contact Clearance "

26. Any Objectional Noise? No Any Objectional Heating? No (explain)

(Over)

27. Elev. Motor Serial No. 303406 (size) 268 Ht (type) 355 (h.p.) 315 (n.l. volts) (f.l. volts) 74/63 (n.l.) 130 (f.l.)

28. Motor Generator: 5 BH 6 (size) 1200 (rpm) (gen.) 70 kw. (gen. volts) 215 (gen. amps.)

Gen. Driving Motor 3046 (size) 110 (hp) 480 (volts) 138 per line (amps.) 50 (temperature rise)

Exciter 73 6X (type) 1200 (rpm) 7465

29. Commutation Good (elev. motor) Good (gen.) (d. c. gen. motor) Good

30. Controller 73 UAT (type) Serial No. 219563 W/D No. 23-A456987 H

Damping-Condensers Total Used MFDS. 3200 Res. Value 30 Condensers in Brake Timing MFDS.

31. Overload Relays Checked, Controller and Starter: 1P 18 2P 16 (time in seconds) 3P 13 ; 3P 600 (amps.)

32. Actual Line Voltage (At P. H. Switch) 455 (start) 460 (idle) 455 (full speed)

33. Main Fuses or Circuit Breaker Setting 200 Rectifier or Exciter Voltage 124 (idle) 120 (full load)

34. Car Speed, Elevator Motor Current, and Voltage Values: 128 128

NOTE: The values for Items 34 thru 38 should be obtained with CORRECT counterbalance.

Speed for all Elevators—All Ammeter Readings for U. M. V. and D. C.—Full Load Reading Only for A. C.—Indicate Negative Readings with Minus Sign.)

Actual Weight In Car	Car #11	Car Speed F. P. M.	Amperes Start	Amperes Run	Amperes Stop	Volts Run	Micro Slow-Speed F.P.M.
0 #	No Load Up	700	140	-160	-420	285	
0 #	No Load Do.	660	440	220	-80	280	
3400 #	Balance Load Up	685	380	20	-320	280	20
3400 #	Balance Load Do.	685	380	20	-320	280	20
8000 #	Full Load Up	680	560	240	-140	280	
8000 #	Full Load Do. (Field Switch Out)	690	180	-180	-510	280	
8000 #	Full Load Do. (Field Switch In)	580	180	175	-480	280	

41. Volts

Car Button

CBo to CB + 135

CBo to CTB 35

CBo to HL1 150

CBo to AC1 100

Hall Button

Bo to B + 132

Bo to B − 35

Bo to HL1 70

Bo to AC1 105

35. Car Speed Bal. Load Full Field 580 Arm. Volts Bal. Load Full Field 280

Elev. Motor Field Voltage 30 (idling) 75 (full speed) 120 (leveling) Norm. Circ. Current 6 (amps.) No. Turns Series Fld. 15

36. Loop Cir. Drop-hold Brake Current Rise Approach 0 Relevel 0

Compounding Spread No Load HSL or TL (cross out one) Speed 17 (f.p.m.) Up 107 Do. 90

Feed Back Ratio HSL Speed 2:1 Comp. Spread No Load 10U to 70U (accel.) (stop) (lev.)

37. Loop Cir. Amps. Current Stall Condition: LFR (Full) 8 FPM 1RL 16 FPM 2RL 30 FPM 3RL

38. Flight Time (Start to Stop) Bal. Load 1 Floor (in secs.) 4.6 (up) 4.6 (down) Fl. Height 12' 8" } For Car Speeds 200 F. P. M. and Over. Brake to Brake

Flight Time (Start to Stop) No Load 1 Floor 4.5 (up) 4.4 (down) Fl. Height 12' 8" }

39. Has Geared Machine Been Lined By Head Method? ☐

40. Gov. Seal Nos. Cy 718 Cy 720

42. Remarks

Sup't Mr. Pope

Inspected by: City [ ] State [ ] Gov't [ ]

Inspector's Name

In Service (date)

Erector Mr. Ritchie

Adjuster Mr. C. L. Squires

Approved by (Field Engineer)

Zone At.

(Please Do Not Submit Incomplete Reports to Headquarters)

Form 992A (5-63)
PRINTED IN U.S.A.

ELECTRIC ELEVATOR FIELD TEST AND DATA REPORT

Car #12

(Send One Copy To General Construction Manager's Office)

1. Name VAB Contract No. 301043 Date 9 — 65

2. Location Merritt Island (City) Florida (State)

3. Duty 8000 (lbs.) @ 700 (fpm) Pass. [X] Frt. [ ] Ser. [ ] SW [ ] DW [ ]

4. Confirmed Power DC [ ] AC [X] 480 (volts) 3 (phase) 60 (freq.) 4 (wires)

5. Mach 269 HT (size) Sheave 36 (diam.) "Round (groove) ° Located OH [ ] Below [ ] Side [ ] Shipped (date)

6. Operation: C.S. [ ] D.B. [ ] P.B. [ ] Coll. P.B. [ ] S.C. [ ] U.A.L. [X] Other (name) U.M.V. [X] Resist. [ ]

7. Ropes (no.) 5/8 (size) Roping 1:1 [X] 2:1 [ ] or (denote) Rope Mfr.

8. Compensation 5/8 — 6 (size and no.) Tied Down No Type Car Safety Special (d) Cwt.

9. Rise 49 ' 9 " No. Stops 33 No. Openings 33 Specified Counterbalance 42.5 %

10. Door Opening 60 (width) " 1 Sp.S.O. 2 Sp. S.O. X (check type of doors) C.O. Hangers (type) Au (car) 7060 (hoistway)

11. Door Operator 6970 A (type) Door Detector s/s Photo — bell (type) Otis Service (type) (start date)

---

12. Counterbalance Test: Crank [ ] D.C. Ammeter [X] Tachometer [X] Other [ ] (explain)

13. Bal. Load 3400 (lbs.) Subwts. 29 (no.) 13 @ 276 (approx. ¼ lb./cu.") Lbs.

14. To Correct Counterweighing 0 (number) Sub Weights were (Added) (Removed) (cross out one) No. Bal. Weights Added {Car 0 / Cwt. 0}

15. Car Safety Test: Hand [ ] Runaway [ ] Load in Car? 8000 (lbs.) Car Set Level? yes (within ¼" per foot of d. b. g.) Slide 0 ' 1 " (rail marking)

Safety Test: Hand [ ] Runaway [ ] Load in Car? (lbs.) CWT. Slide ' "

Slowdown Hoistway Sw. Set Do. ' " From Top Fl.—Up From Bott. Fl. ' " If on Sel. Ck. [ ]

Slowdown Contact Closes: Up (f. p. m.) Do. (f. p. m.) On Gov. [ ] Plug. Sw. Sel. [ ] (check one)

16. Governor Tripping Speed 850 (f. p. m.) How Checked? Overspeed tac. Contact 810 (pot) (f. p. m.) Contact 740 (field) (f. p. m.)

17. O.H. Car 112 " Pit Cwt. 20½ " Up Limit Opens 12 "

18. O.H. Cwt. 118½ " Pit Car 12 " Do. Limit Opens 12 "

19. Pit Depth 144 " Final Limits Through Bolted [X] O.H. Car to Nearest Striking Point 105½ "

20. Buffers: Car Type oil Stroke 33½ " Cwt. Type oil Stroke 33½ "

21. Car Statically Balanced % Load { Top Hoistway [X] / Center Hoistway [X] / Bottom Hoistway [X] } Roller Guides Adjusted [X]

22. Power Oper. Doors yes A.S.A. Code Door Close Time 5 Secs. Door Speed 1' of Fast Speed 1 Secs.

Door Close Time (Otis Cntl) 5 Secs. Lbs. Thrust Close 28 Door Open Time 4.5 8 Secs.

Time Before Nudging 15 Secs. Door Close Time in Nudging 8 Secs.

23. Worm Gear Bearing Contacts: Cross Corner [ ] Central [ ]

24. Brake Set 125% Load A.C. Per Brake Load Chart D.C. YES Lbs. in Car 10,000

25. Worm Thrust Clearance [redacted] Backlash Secondary Gear Contact Clearance "

26. Any Objectional Noise? NO Any Objectional Heating? NO (explain)

(Over)

27. Elev. Motor Serial No. 303407 | 269 HT (size) | 355 (amps.) | 315 (n.l. volts) | (f.l. volts) | 74/63 (rpm) | 130 (hp)

28. Motor Generator: 5 BMG (size) | 1200 (rpm) | 70 (gen. kw.) | 315 (gen. volts) | 222 (gen. amps.)

Gen. Driving Motor 30 AC (size) | 110 (hp) | 480 (volts) | 130 (amps. per line) | 50 (temperature rise)

Exciter 73 GX (type) | 1200 (rpm) | 7.5 (kw.)

29. Commutation: Good (elev. motor) | Good (gen.) | (d. c. gen. motor) | Good (exciter)

30. Controller 73 UAL (type) Serial No. 21 95 64 W/D No. 23 - A4S6987H

Damping-Condensers Total Used MFDS 3200 Res. Value 30 Condensers in Brake Timing MFDS 11,200

31. Overload Relays Checked, Controller and Starter: 1P 21 2P 18 (time in seconds) 3P 11; 3P 520 (amps.)

32. Actual Line Voltage (At P. H. Switch) 457 (start) | 460 (idle) | 460 (full speed)

33. Main Fuses or Circuit Breaker Setting 200 (amps.) Rectifier or Exciter Voltage 120 (idle) 118 (full load)

34. Car Speed, Elevator Motor Current, and Voltage Values:

NOTE: The values for Items 34 thru 38 should be obtained with CORRECT counterbalance.

Speed for all Elevators—All Ammeter Readings for U. M. V. and D. C.—Full Load Reading Only for A. C.—Indicate Negative Readings with Minus Sign.)

Actual Weight In Car	Car #12	Car Speed F. P. M.	Amperes Start	Amperes Run	Amperes Stop	Volts Run	Micro Slow-Speed F.P.M.
0 #	No Load Up	692	140	-162	-465	277	
0 #	No Load Do.	690	480	225	-115	278	
3400 #	Balance Load Up	685	360	28	-310	280	21
3400 #	Balance Load Do.	690	360	28	-310	280	21
8000 #	Full Load Up	680	565	280	-95	285	
8000 #	Full Load Do. (Field Switch Out)	705	160	-212	585	280	
8000 #	Full Load Do. (Field Switch In)	610	160	-180	520	275	

41. Volts

Car Button 155
CBo to CB + 35
CBo to CTB 160
CBo to HL1 120
CBo to AC1

Hall Button 132
Bo to B + 35
Bo to B − 70
Bo to HL1 105
Bo to AC1

35. Car Speed Bal. Load Full Field 590 Arm. Volts Bal. Load Full Field 280

Elev. Motor Field Voltage 30 (idling) 75 (full speed) 120 (leveling) Norm. Circ. Current 8 (amps.) No. Turns Series Fld. 12

36. Loop Cir. Drop-hold Brake Current Rise Approach 0 Releveling 0

Compounding Spread No Load HSL or TL (cross out one) Speed 25 (f.p.m.) Up 117 Do. 92

Feed Back Ratio HSL Speed 2:1 Comp. Spread No Load 10U to 70U

37. Loop Cir. Amps. Current Stall Condition: LFR (Full) 6 FPM (accel.) 1RL 14FPM (stop) 2RL 28 FPM (lev.) 3RL

38. Flight Time (Start to Stop) Bal. Load 1 Floor 4.4 (up) 4.4 (down) Fl. Height 12' 8"

Flight Time (Start to Stop) No Load 1 Floor 4.2 (up) 4.3 (down) Fl. Height 12' 8"

} For Car Speeds 200 F. P. M. and Over. Brake to Brake

39. Has Geared Machine Been Lined By Head Method? ☐

40. Gov. Seal Nos. Cy 710 Cy 706

42. Remarks

Sup't Mr. Pope

Erector Mr. Ritchie

Inspected by: City [ ] State [ ] Gov't [ ]

Adjuster Mr. C. L. Squires

Inspector's Name

Approved by (Field Engineer)

In Service (date)

Zone 1A

(Please Do Not Submit Incomplete Reports to Headquarters)

Form 992A (5-63) PRINTED IN U.S.A.

ELECTRIC ELEVATOR FIELD TEST AND DATA REPORT

Car #13

(Send One Copy To General Construction Manager's Office)

1. Name VERTICAL ASSEMBLY BLDG. L.C. 39 Contract No. 301044 Date 2-15-66

2. Location MILA (City) ____ (State)

3. Duty 8000 (lbs.) @ 700 (fpm) Pass. [X] Frt. [ ] Ser. [ ] SW [ ] DW [ ]

4. Confirmed Power DC [ ] AC [X] 480 (volts) 3 (phase) 60 (freq.) 4 (wires)

5. Mach 269 HT (size) Sheave 36 (diam.)" Round (groove)° Located OH [X] Below [ ] Side [ ] Shipped ____ (date)

6. Operation: C.S. [ ] D.B. [ ] P.B. [ ] Coll. P.B. [ ] S.C. [ ] U.A.L. [X] Other ____ (name) U.M.V. [X] Resist. [ ]

7. Ropes 8 (no.) 5/8 (size) Roping 1:1 [X] 2:1 [ ] or ____ (denote). Rope Mfr. ____

8. Compensation 5/8" - 6 (size and no.) Tied Down ____ Type Car Safety Special D. Cwt. ____

9. Rise 419 ' 9 " No. Stops 32 No. Openings 33 Specified Counterbalance 42.5 %

10. Door Opening 60 (width)" 1 Sp.S.O. ____ 2 Sp. S.O. X (check type of doors) C.O. ____ Hangers (type) AU (car) 7060 (hoistway)

11. Door Operator 6970 A (type) Door Detector Safety Shoe Light Ray (type) Otis Service ____ (type) ____ (start date)

---

12. Counterbalance Test: Crank [ ] D.C. Ammeter [X] Tachometer [X] Other [ ] (explain)

13. Bal. Load 3400 (lbs.) Subwts 13 (no.) 31 @ 297 (approx. ¼ lb./cu.") 360 Lbs.

14. To Correct Counterweighing 0 (number) Sub Weights were (Added) (Removed) (cross out one) No. Bal. Weights Added { Car 0 / Cwt. 0

15. Car Safety Test: Hand [ ] Runaway [ ] Load in Car? 8000 (lbs.) Car Set Level? Yes (within ¼" per foot of d. b. g.) Slide ' 58 (rail marking)

~~XXWXXXSXXXXXXXXXX~~ Hand [ ] Runaway [ ] Load in Car? ____ (lbs.) CWT. Slide ' "

~~XXXXSXXXXXXXXXX~~ Hoistway Sw. Set Do. ' " From Top Fl.—Up From Bott. Fl. ' " If on Sel. Ck. [ ]

~~XSpeedXXXXSXXXXXXXXX~~ Contact Closes: Up (f. p. m.) Do (f. p. m.) On Gov. [ ] Plug. Sw. Sel. [ ] (check one)

16. Governor Tripping Speed 845 (f. p. m.) How Checked? Field Overspeed Contact 800 (pot) (f. p. m.) Contact 740 (field) (f. p. m.)

17. O.H. Car 9'3" " Pit Cwt. 15 " Up Limit Opens 12 "

18. O.H. Cwt. 8'5" " Pit Car 11 " Do. Limit Opens 10 "

19. Pit Depth 12' " Final Limits Through Bolted [X] O.H. Car to Nearest Striking Point 8'5" "

20. Buffers: Car Type Oil (2) Stroke 33½ " Cwt. Type Oil Stroke 33½ "

21. Car Statically Balanced % Load 30% { Top Hoistway [X] / Center Hoistway [X] / Bottom Hoistway [X] } Roller Guides Adjusted [X]

22. Power Oper. Doors Yes A.S.A. Code Door Close Time 5 Secs. Door Speed 1' of Fast Speed 1 Secs.

Door Close Time (Otis Card) 5.5 Secs. Lbs. Thrust Close 24 Door Open Time 4.2 Secs.

Time Before Nudging 16 Secs. Door Close Time in Nudging 8 Secs.

~~XXX~~ Worm Gear Bearing Contacts: Cross Corner [ ] Central [ ]

24. Brake Set 125% Load A.C. ____ Per Brake Load Chart D.C. Yes Lbs. in Car 10,000

~~25X~~ Worm Thrust Clearance ____" Backlash ____ Secondary Gear Contact ____ Clearance ____"

26. Any Objectional Noise? NO Any Objectional Heating? NO (explain)

(Over)

27. Elev. Motor Serial No. 303408 ..... 269HT (size) 355 (amps.) 315 (n.l. volts) ——— (f.l. volts) 74/63 (rpm) 130 (hp)

28. Motor Generator: 5 BMG (size) 1200 (rpm) 70 (gen. kw.) 315 (gen. volts) 222 (gen. amps.)

Gen. Driving Motor 30 AC (size) 110 (hp) 480 (volts) 130 (amps. per line) 50°C (temperature rise)

Exciter 73 GX (type) 1200 (rpm) 7.5 (kw.)

29. Commutation Good (elev. motor) Good (gen.) ——— (d. c. gen. motor) Good (exciter)

30. Controller 75 UAL (type) Serial No. 219565 FBR W/D No. 23-A4S6987H

Damping-Condensers Total Used MFDS 11,200 Res. Value 300 Condensers in Brake Timing MFDS 1600

31. Overload Relays Checked, Controller and Starter: 1P 23 2P 17 (time in seconds) 3P 15 ; 3P 550 (amps.)

32. Actual Line Voltage (At P. H. Switch) 470 (start) 480 (idle) 475 (full speed)

33. Main Fuses or Circuit Breaker Setting 200 (amps.) Rectifier or Exciter Voltage 127 (idle) 125 123 (full load) 122

34. Car Speed, Elevator Motor Current, and Voltage Values:

NOTE: The values for Items 34 thru 38 should be obtained with CORRECT counterbalance.

Speed for all Elevators—All Ammeter Readings for U. M. V. and D. C.—Full Load Reading Only for A. C.—Indicate Negative Readings with Minus Sign.)

Actual Weight In Car	Car #13	Car Speed	Amperes			Volts	Micro Slow-Speed F.P.M.
		F. P. M.	Start	Run	Stop	Run	
0 #	No Load Up	680	60	-140	-350	296	
0 #	No Load Do.	670	360	200	-60	306	
3400 #	Balance Load Up	690	270	25	-260	306	
3400 #	Balance Load Do.	690	260	25	-270	306	
8000 #	Full Load Up	690	500	285	-30	320	
8000 #	Full Load Do. (Field Switch Out)	702	40	-210	-530	315	
8000 #	Full Load Do. (Field Switch In)	650	40	-190	-525	312	

41. Volts

Car Button

CBo to CB + 135

CBo to CTB -30

CBo to HL1 120

CBo to AC1 145

Hall Button

Bo to B + 140

Bo to B - -45

Bo to HL1 45

Bo to AC1 110

35. Car Speed Bal. Load Full Field 630 Arm. Volts Bal. Load Full Field 302

Elev. Motor Field Voltage 42 (idling) 82 (full speed) 112 (leveling) Norm. Circ. Current 20 (amps.) No. Turns Series Fld. 7

36. Loop Cir. Drop-hold Brake Current Rise Approach ——— Relevel ———

Compounding Spread No Load ~~XSXXXXXXX~~ 1E (cross out one) Speed 15 (f.p.m.) Up 75 Do 60

Feed Back Ratio HSL Speed 1.9:1 Comp. Spread No Load 10U to 70U ——— (accel.) ——— (stop) ——— (lev.)

37. Loop Cir. Amps. Current Stall Condition: LFR (Full) 5 1RL 9 2RL 22 3RL ———

38. Flight Time (Start to Stop) Bal. Load 1 Floor 5 (in secs.) (up) 5 (down) Fl. Height 12'8" } For Car Speeds 200 F. P. M. and Over. Brake to Brake

Flight Time (Start to Stop) No Load 1 Floor 5 (up) 5 (down) Fl. Height 12'8" }

~~XXXXXXXX~~ Geared Machine Been Lined By Head Method? ☐

40. Gov. Seal Nos. BL 938 003876

42. Remarks

Sup't Mr. C. P. Ryan

Inspected by: City [ ] State [ ] Gov't [ ]

Inspector's Name

In Service (date)

Erector Mr. B. R. Ritchie

Adjuster Mr. G. E. Thayer

Approved by (Field Engineer)

Zone

(Please Do Not Submit Incomplete Reports to Headquarters)

Form 992A (5-63)
PRINTED IN U.S.A.

ELECTRIC ELEVATOR FIELD TEST AND DATA REPORT

Car #14

(Send One Copy To General Construction Manager's Office)

1. Name VERTICAL ASSEMBLY BLDG. L.C. 39 Contract No. 301045 Date 2-14-66

2. Location MILA (City) ; (State)

3. Duty 8000 (lbs.) @ 700 (fpm) Pass. [X] Frt. [ ] Ser. [ ] SW [ ] DW [ ]

4. Confirmed Power DC [ ] AC [X] 480 (volts) 3 (phase) 60 (freq.) 4 (wires)

5. Mach. 269 HT (size) Sheave 36 (diam.)" Round (groove)° Located OH [X] Below [ ] Side [ ] Shipped (date)

6. Operation: C.S. [ ] D.B. [ ] P.B. [ ] Coll. P.B. [ ] S.C. [ ] U.A.L. [X] Other (name) U.M.V. [X] Resist. [ ]

7. Ropes 8 (no.) 5/8 (size) Roping 1:1 [X] 2:1 [ ] or (denote) Rope Mfr.

8. Compensation 5/8 (size and no.) - 6 Tied Down ---- Type Car Safety Special D... Cwt. ----

9. Rise 419 9" No. Stops 32 No. Openings 33 Specified Counterbalance 42.5 %

10. Door Opening 60 (width)" 1 Sp.S.O. 2 Sp. S.O. X (check type of doors) C.O. Hangers (type) AU (car) 7060 (hoistway)

11. Door Operator 6970 A (type) Door Detector Safety Shoe - Light Ray (type) Otis Service (type) (start date)

---

12. Counterbalance Test: Crank [ ] D.C. Ammeter [X] Tachometer [X] Other [ ] (explain)

13. Bal. Load 3400 (lbs.) Subwts. 13 (no.) @ 297 (approx. ¼ lb./cu.") Lbs.

14. To Correct Counterweighing (number) Sub Weights were (Added) (Removed) (cross out one) No. Bal. Weights Added { Car ; Cwt. 4

15. Car Safety Test: Hand [ ] Runaway [ ] Load in Car? 8000 (lbs.) Car Set Level? Yes (within ¼" per foot of d. b. g.) Slide 4 ' 8" (rail marking)

~~CWT Safety~~ Test: Hand [ ] Runaway [ ] Load in Car? (lbs.) CWT. Slide ' "

~~Pot~~ Sw. Slowdown Hoistway Sw. Set Do. ' " From Top Fl.—Up From Bott. Fl. ' " If on Sel. Ck. [ ]

~~Speed Pot~~ Sw. Slowdown Contact Closes: Up (f. p. m.) Do (f. p. m.) On Gov. [ ] Plug. Sw. Sel. [ ] (check one)

16. Governor Tripping Speed 850 (f. p. m.) How Checked? Field Overspeed Contact 810 (pot) (f. p. m.) Contact 740 (field) (f. p. m.)

17. O.H. Car 9'1½" Pit Cwt. 24" Up Limit Opens 12"

18. O.H. Cwt. 8'3" Pit Car 11½" Do. Limit Opens 10"

19. Pit Depth 12' Final Limits Through Bolted [X] O.H. Car to Nearest Striking Point 8' 10"

20. Buffers: Car Type Oil (2) Stroke 33½" Cwt. Type Oil Stroke 33½"

21. Car Statically Balanced % Load 30% { Top Hoistway [X] Center Hoistway [X] Bottom Hoistway [X] } Roller Guides Adjusted [X]

22. Power Oper. Doors Yes A.S.A. Code Door Close Time 4.7 Secs. Door Speed 1' of Fast Speed 1.1 Secs.

Door Close Time (Otis Card) 5. Secs. Lbs. Thrust Close 18 Door Open Time 3. Secs.

Time Before Nudging 16 Secs. Door Close Time in Nudging 7.5 Secs.

~~23~~. Worm Gear Bearing Contacts: Cross Corner [ ] Central [ ]

24. Brake Set 125% Load A.C. Per Brake Load Chart D.C. YES Lbs. in Car 10,000

~~25~~ Worm Thrust Clearance " Backlash Secondary Gear Contact Clearance "

26. Any Objectional Noise? NO Any Objectional Heating? NO (explain)

(Over)

27. Elev. Motor Serial No. 303409 ( ) 269HT (size) 355 (amps.) 315 (n.l. volts) ____ (f.l. volts) 74/63 (rpm) 130 (hp)

28. Motor Generator: 5 BMG (size) 1200 (rpm) 70 (gen. kw.) 315 (gen. volts) 222 (gen. amps.)

Gen. Driving Motor 30 AC (size) 110 (hp) 480 (volts) 130 (amps. per line) 50°C (temperature rise)

Exciter 73 GX (type) 1200 (rpm) 7.5 (kw.)

29. Commutation Good (elev. motor) Good (gen.) ____ (d. c. gen. motor) Good (exciter)

30. Controller 75 UAL (type) Serial No. 219566 W/D No. 23-A4S6987H FBR

Damping-Condensers Total Used MFDS 12,800 Res. Value 30 Condensers in Brake Timing MFDS 4800

31. Overload Relays Checked, Controller and Starter: 1P 23 2P 15 3P 19 ; 3P 490 (amps.) (time in seconds)

32. Actual Line Voltage (At P. H. Switch) 470 (start) 480 (idle) 475 (full speed)

33. Main Fuses or Circuit Breaker Setting 200 (amps.) (Rectifier) or Exciter Voltage 125 (idle) 123 (full load)

34. Car Speed, Elevator Motor Current, and Voltage Values:

NOTE: The values for Items 34 thru 38 should be obtained with CORRECT counterbalance.

Speed for all Elevators—All Ammeter Readings for U. M. V. and D. C.—Full Load Reading Only for A. C.—Indicate Negative Readings with Minus Sign.)

Actual Weight In Car	Car #14	Car Speed F. P. M.	Amperes Start	Amperes Run	Amperes Stop	Volts Run	Micro Slow-Speed F.P.M.
0 #	No Load Up	695	100	-140	-350	284	
0 #	No Load Do.	675	410	200	-20	290	
3400 #	Balance Load Up	685	260	25	-220	300	15
3400 #	Balance Load Do.	685	260	25	-220	300	15
8000 #	Full Load Up	700	490	265	-20	320	
8000 #	Full Load Do. (Field Switch Out)	695	110	-200	-450	296	
8000 #	Full Load Do. (Field Switch In)	640	100	-180	-440	296	

41. Volts

Car Button
CBo to CB +145
CBo to CTB -30
CBo to HL1 120
CBo to AC1 145

Hall Button
Bo to B +140
Bo to B -45
Bo to HL1 45
Bo to AC1 110

35. Car Speed Bal. Load Full Field 620 Arm. Volts Bal. Load Full Field 298

Elev. Motor Field Voltage 25 (idling) 88 (full speed) 125 (leveling) Norm. Circ. Current 25 (amps.) No. Turns Series Fld 6

36. Loop Cir. Drop-hold Brake Current Rise Approach ____ Relevel ____

Compounding Spread No Load ~~HSL~~ HX (cross out one) Speed 13 (f.p.m.) Up 40 Do 27

Feed Back Ratio HSL Speed 1.8:1 F.P.M. Comp. Spread No Load 10U to 70U ____ (accel.) (stop) (lev.)

37. ~~Knowing Current~~ LFR (Full) 6 1RL 10 2RL 25 3RL ____

38. Flight Time (Start to Stop) Bal. Load 1 Floor 5 (in secs.) (up) 5 (down) Fl. Height 12'8" } For Car Speeds 200 F. P. M. and Over. Brake to Brake

Flight Time (Start to Stop) No Load 1 Floor 5 (up) 5 (down) Fl. Height 12'8" }

39. Has Geared Machine Been Lined By Head Method? ☐

40. Gov. Seal Nos. 003884 003897

42. Remarks

Sup't Mr. C. P. Ryan

Inspected by: City [ ] State [ ] Gov't [ ]

Inspector's Name

In Service (date)

Erector Mr. B. R. Ritchie

Adjuster Mr. G. E. Thayer

Approved by (Field Engineer)

Zone

(Please Do Not Submit Incomplete Reports to Headquarters)

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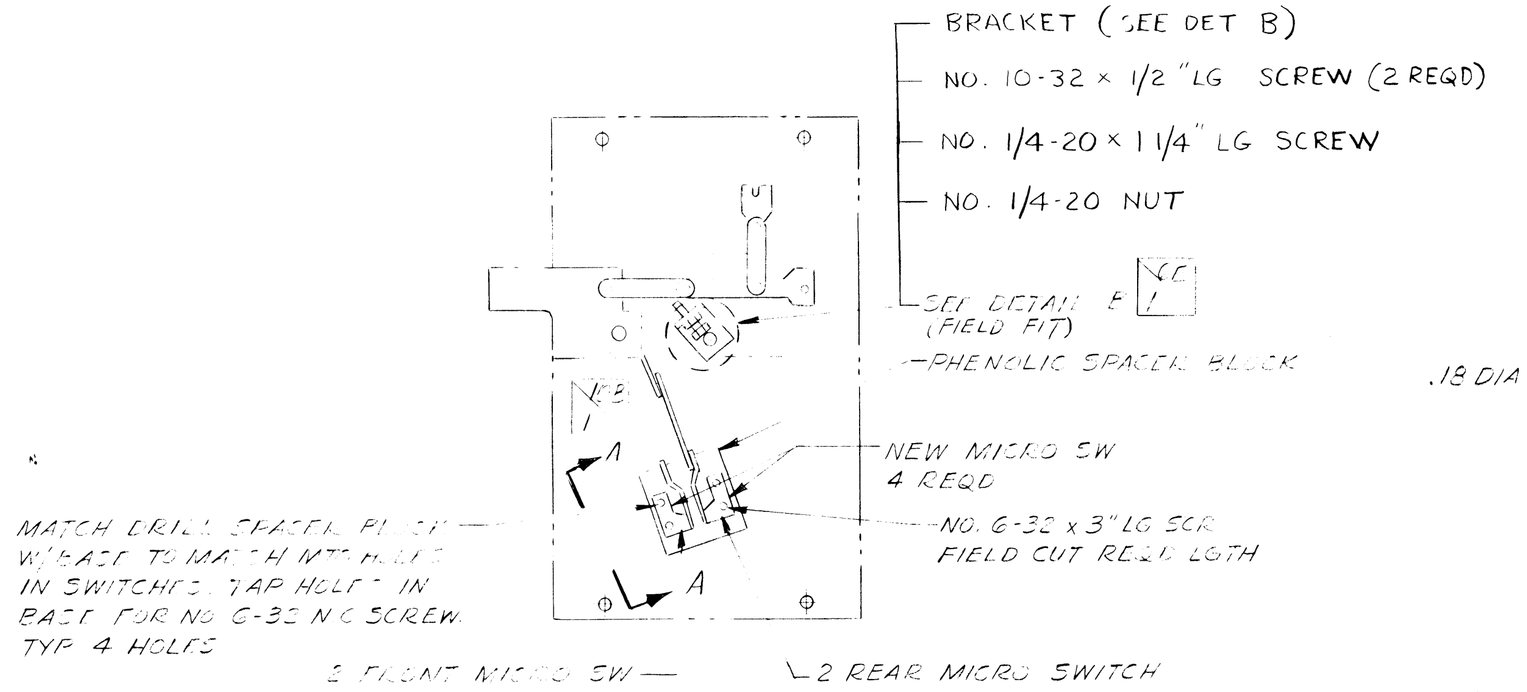
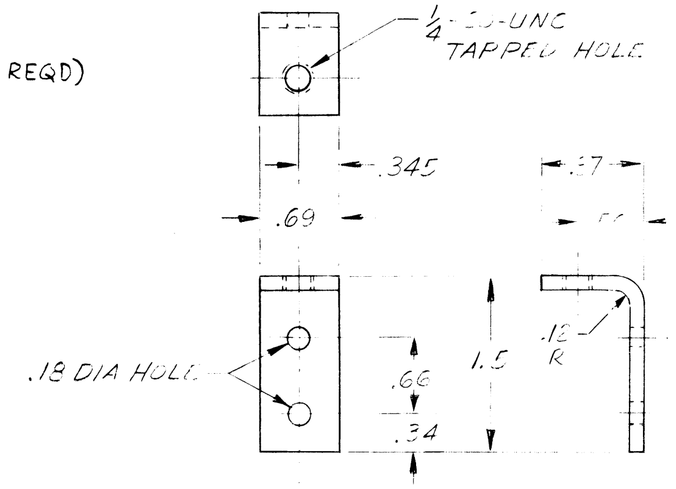
PART NO.	MF	REVISIONS				
		ZONE	SYM	DESCRIPTION	DATE	APPROVAL


BRACKET (SEE DET B)
NO. 10-32 × 1/2 "LG SCREW (2 REQD)
NO. 1/4-20 × 1 1/4" LG SCREW
NO. 1/4-20 NUT
SEE DETAIL B (FIELD FIT)
PHENOLIC SPACER BLOCK
NEW MICRO SW 4 REQD
NO. 6-32 x 3" LG SCR FIELD CUT REQ'D LGTH
MATCH DRILL SPACER PL AT W/CAST TO MATCH MTG HOLES IN SWITCHES. TAP HOLES IN CAST FOR NO 6-32 N C SCREW. TYP 4 HOLES
3 FRONT MICRO SW
2 REAR MICRO SWITCH

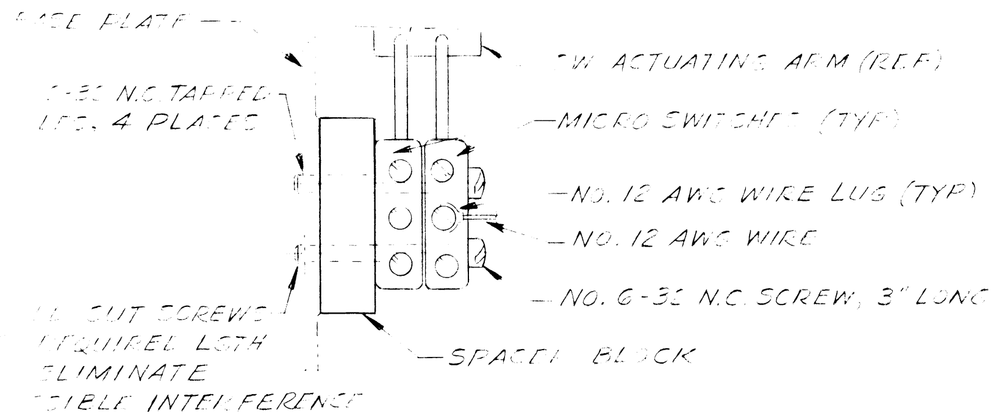
SWITCH INSTALLATION
REF: OTIS DWG 57-6410E
N.T.S.
TYP ELEVATORS 1, 3 & 6
REF RLK ASSY BOXES



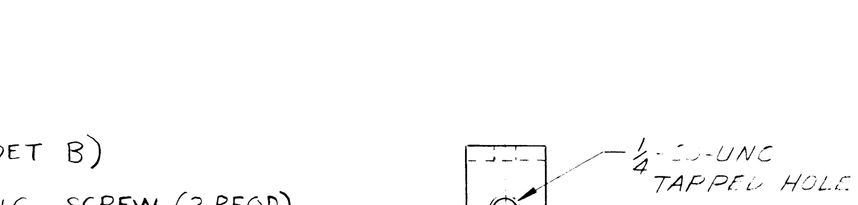
DETAIL B
MATERIAL: 1/8 THK CRS
SCALE: 1" = 1"

NOTES:

1. INSTALL AND CONNECT (4) MICRO SWITCHES IN THE RLK ASSEMBLY BOXES LOCATED ON HIGH BAY ELEVATORS 1, 3 & 6 IN THE VAB.
   REFERENCE:
   BENDIX FEC NO. F-39-3086 (SH. 1 & 2)
2. ALL WORK TO BE IN ACCORDANCE WITH KSC-E-165A, KSC-E-166 AND "N.E.C."
3. THIS DWG IS RELEASED TO (1) REPLACE CONSTRUCTION DWG 13307-01 DATED 5-5-69 AND (2) REFLECT AS BUILT HARDWARE.


CASE PLATE
S.W. ACTUATING ARM (REF)
6-32 N.C. TAPPED HOLES, 4 PLACES
MICRO SWITCHES (TYP)
NO. 12 AWG WIRE LUG (TYP)
NO. 12 AWG WIRE
NO. 6-32 N.C. SCREW, 3" LONG
#8 SPLIT SCREWS (TRIMMED LGTH TO ELIMINATE POSSIBLE INTERFERENCE)
SPACER BLOCK

SECTION A-A
N.T.S.



PARTIAL ELEMENTARY DIAGRAM
TYP HIGH BAY ELEV 1, 3 & 6
REF: OTIS ELEV DWG 23-A456987H

MATERIAL REQUIREMENTS FOR ELEVATORS 1, 3 & 6

REQD	PART NO. OR FED-STK NO.	DESCRIPTION
4	BZ-2PW855-A2	SWITCH, GENERAL PURPOSE, SPDT 15AMP C.R. MICRO SWITCH TYPE Z
3	FSN 5970-198-9291	INSULATION BLOCK ELEC, PHENOLIC RESIN IMPREGNATED FABRIC 3"X3"X1" MIL-P-15035
12	NAS601-46	SCREW "G 32 x 3" LG FSN 5305-619-2116
3	MS35307-310	SCREW "1/4-20 x 1 1/4" LG FSN 5305-021-3668
6	MS35276-263	SCREW "10-32 x 1/2 LG FSN 5305-912-4838
3	MS16203-13	NUT, PLAIN HEXAGON 1/4-20 FSN 5310-105-5919
3	REF DET B	1/8" CRS EXISTING BRACKET MADE SURPLUS BY ECP 13307 MAY BE USED
20	NO 12 AWG WIRE LUG	CRIMP STYLE BURNDY
AR FT	NO. 12 AWG WIRE	TYPE THW 600 V BLACK INS, SOLID COPPER

		UNLESS OTHERWISE SPECIFIED	ORIGINAL DATE OF DRAWING JUNE 5, 1969	INSTALLATION OF SAFETY SWITCHES ELEVATOR CAR DOORS	JOHN F. KENNEDY SPACE CENTER, NASA KENNEDY SPACE CENTER, FLORIDA
SEE ENGINEERING RECORDS		DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ANGLES	DRAFTSMAN CHECKER		DISTR CODE
		MATERIAL NOTED	CHECKER STRESS		DWG SIZE D 79K00386
		HEAT TREATMENT	ENGINEER ENGINEER		
NEXT ASSY	USED ON	FINAL PROTECTIVE FINISH	SUBMITTED		
APPLICATION			APPROVED DIRECTOR	WEIGHT CHECKER DATE CODE 22264	SCALE NOTED UNIT WEIGHT SHEET 1 OF 1
					DRA FE-09FY022-007

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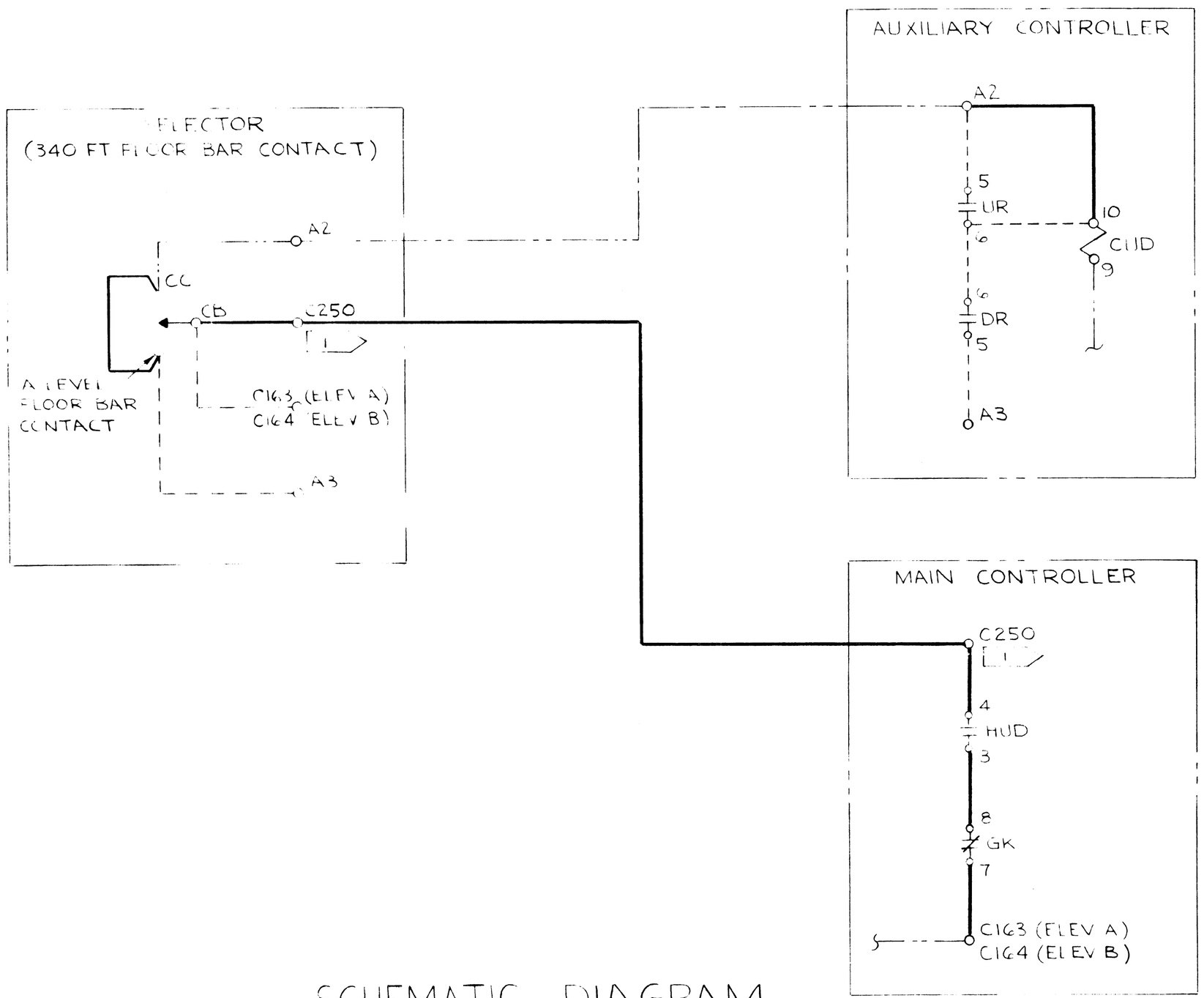
PART No.	M F	REVISIONS				
		ZONE	SYM	DESCRIPTION	DATE	APPROVAL

NOTES

1. INK STAMP EXISTING SPARE TERMINAL AS SHOWN USING ⅛ HIGH BLACK CHARACTERS PER KSC-STD-E-0015.
2. INSTALL WIRING AS SHOWN USING F/N (1) & (2).
3. DELETE WIRING AS SHOWN IN SCHEMATIC.
4. WIRING TO BE FEE[illegible]
5. SUBSTITUTION OF MATERIALS, PARTS & PROCESSES ARE AUTHORIZED PER KK04427.

LEGEND

- EXISTING WIRING (FOR REF ONLY)
- WIRING TO BE ADDED
- WIRING TO BE DELETED



SCHEMATIC DIAGRAM

ELEVATOR "A" SHOWN
(ELEV "B" SAME AS "A" EXCEPT AS SHOWN)

				V	A,R		2	AWG NO. 16			WIRE, INS, ELEC	(APPROX 60")	MIL W 16878/1	TYPE B	16,	COLOR BLK
				V	60		1	MS25036-108			LUG, TERM.					
				-	-			-1			MODIFICATION					
ITEM NO.	QTY REQ'D	ZONE	FIND NO. OR ITEM NO.	R	PART OR STOCK NO. / DRAWING NO.	REV	DATA LTR	NO REQ'D/NOTE	SPECIFICATION, STANDARD OR REMARKS / DESCRIPTION	STOCK SIZE	MATL SPEC	FINISH CODE	HT. TREAT			DISTR CODE

LIST OF MATERIAL

76K04223	SATURN V	9ML001A	BATC-09-1260	-1				
NEXT ASSY	USED ON	SYSTEM NO.	SERIAL NUMBER	PART NUMBER	RELEASE COLUMN IND	DWG SH NO.	REV LTR	
APPLICATION								

SEE ENGINEERING RECORDS

NEXT ASSY / USED ON: APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS — DECIMALS — ANGLES —
MATERIAL
HEAT TREATMENT
FINAL PROTECTIVE FINISH

CONTR NO. NAS 8-5608 SCH III
CHG NO. ECP 1297
ORIG BY S-8751

ORIGINAL DATE OF DRAWING 26 JAN 70
DRAFTSMAN M.A. Martin — CHECKER
CHECKER — STRESS
ENGINEER C.E. Miller — ENGINEER
SUBMITTED W. W. Thomas 1/26/70
APPROVED
DIRECTOR

ELEVATOR SELECTOR MODIFICATION

WEIGHT CHECKER | DATE | CODE 22264
SCALE NONE | UNIT WEIGHT

JOHN F. KENNEDY SPACE CENTER, NASA
LAUNCH SUPPORT EQUIPMENT ENGINEERING DIVISION
KENNEDY SPACE CENTER, FLORIDA

DWG SIZE D | 76K31311
SHEET 1 OF 1

KSC FORM 21-6 (REV. 9 68)

ECP - 1297